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THE

NEW ENGLAND

Journal of Dentistry.

Vol. II. DECEMBER, 1883. No. 12.

ORIGINAL COMMUNICATIONS.

DENTITION.

BY JAMES E. GARRETSON, M. D., D. D. S., PHILADELPHIA.

[An address delivered before the Annual Meeting of the New England Dental Society, at Providence, Oct. 4th, 1883.]

Prof. Garretson, in introduction of the subject of his remarks, alluded to the confusion found related with the descriptions and demonstrations of the various microscopic observers, asserting that no two were found to read the pictures of the slides exactly after the same manner. He congratulated the society on the fact that the evening was to show a micro-photographic exhibition and that thus his own views were to find an immediate contrast.

"The subject of tooth development," said the speaker, "is one which associates its interests with surgery quite as much as with physiology. To know how rationally to treat diseases of the dental organism is to understand what such organism is; how the teeth are formed, how they are nourished, how and with what their inflammatory perversions are allied. It is proposed this afternoon to offer a practical demonstration. To show how a tooth is developed out of a papilla. That a papilla is to be accepted as a body sui generis. That a tooth is not a dermoid structure save as this name applies to enamel, which

cap has its peculiarity by reason of an influence exerted on the common plasm of the pulp as this halitus passes through one tunic of mucous membrane to be received against and moulded by a second tunic. It is proposed to let the subject evolve for itself demonstration of the existence of a primitive dental groove, seeing that if an adult jaw be taken, and the inter-dental septi be cut away, there is found a big groove; and a big groove implies gradual enlargement of one which at some time must have been so little that no microscope could see it. Mucous membrane does not dip down, it dips up; this difference, as it is trusted the demonstration will show, is greater than that between tweedle-dum and tweedle-dee. Teeth, it is proposed to point out, for reason of the practical signification of the fact, have a three-fold nutrition, and that such vascularity is correlative by reason of anastomotic connection.

A tooth in its developed state is large when compared with one that has but a twentieth of its growth, a fact of difference conclusive of the truthfulness of a deduction that primarily there is a dental germ.

A dental germ is an organism peculiar and special to itself; it develops into and evolves the component parts of a tooth; it does this, and it does nothing else. When first seen, a dental germ is microscopic. When seen in that expression which is the meaning of its organic relations, it has surrounded itself with tunicæ, with dentine, with cementum, and with enamel. Dentine, cementum, and enamel are resultant of a common secretion, and this secretion lies with the dental pulp. There is no enamel pulp as propounded, and as is thought to be shown, by the microscopist.

Using now different colored chalks and the blackboard, let us pass without further preliminary remarks to the demonstration.

By dentition is meant the development of teeth. Teeth, together with the alveolar process, develop upon the bone proper of the jaws.

In the earliest days of fœtal existence, the jaws are planes of cartilage. These planes are overlaid by mucous membrane. Between the cartilage and the membrane the papillæ known as dental germs are first met with.

The period at which dental germs are earliest seen is about the sixth week of intra-uterine life. At this period, a little sooner or later, such germs are to be exposed by lifting the mucous covering from the basement cartilage. At all subsequent periods previous to eruption section through overlying parts exhibits their presence.

The alveolar process, with its many pits, is simply an osseo-spongy tissue, serving as a common envelope to the growing tooth-germs. In its origin it constitutes the primitive dental groove. This groove is never, however, a ditch, or depression, except as such an idea is conveyed by the pits and depth of an adult jaw. Neither are alveolar process and body of bone one except as regard is had to relationship. Alveolar process is a provision associated with teeth; as dental germs develop, so does it; when the teeth are lost, so also does it disappear. Alveolar tissue grows around papillæ; the dental pits signify obstruction. The papillæ are not first met with in a groove.

A dental germ is made up of a congeries of granular nuclei dispersed irregularly through a firm homogeneous blastema. It is not enclosed in a cell-wall, or membrane of its own; it is a hyaloid structure.

A developing germ carries with it overlying mucous membrane; the membrane hugging it closely. This covering, or envelope, constitutes a tunic; it is to be denominated coat first, or tunica propria. The relationship of this covering to a papilla is precisely that of parietal peritoneum to a knuckle of intestine in incarcerated or strangulated hernia. The shape of this coat is that of the papilla it encapsules. The simple and natural manner by which this tunic is secured by a developing papilla is to be recognized by observation of Sub-fig. 2, diagram 1.

While, after the manner described, a tunic has been secured by the tooth-germ, it is appreciated that the common mucous membrane has in no wise altered its relation to surrounding parts; it abuts closely all the circumference of a papilla; it is contracted, like an elastic substance, about its base; it associates from this base with adjoining parts.

Corresponding with the growth of a papilla is that of its alveolar envelope.

As such envelope is of sub-mucous nature, being an organization arising out of cells existing between the mucous membrane and plate of jaw, among which cells the germ lies, it is to be recognized that as this increases about the germ it necessarily carries around it a second coat, or tunic; tunica reflexa it is not unwarrantable to call it. This now becomes the dental relation; a germ, originally microscopic, has enlarged until it stands in shape and size the representative of a tooth; this germ is enveloped in a double sac; it is overgrown on all its circumference by tissue which later is to express itself as alveolar process

and gum. To understand how the second tunic is taken, reference is again to be made to the diagram, Sub-figs. 4, 5 and 6.

At this period the dental pulp, as the papilla is now to be called, having attained the size of the tooth-crown it represents, commences the formation of dentine. Before the attainment to full size by the papilla, there existed between it and its sac proper a halitus. This halitus, now that the congeries of cytoblasts, or nucleated granules, have obtained their full growth and secretive power, is replaced by a more highly endowed production; the work of matured cells. This secretion constitutes the future dentine. Calcification is progressive with secretion.

As this deposit deepens within the mucous envelope, so the pulp contracts until, finally, it stops at that certain point which maintains within the tooth a canal, or cavity, and a vascular and nervous pulp to occupy it,—this pulp being the contracted original papilla. The vessels of this papilla are wholly analogous to those of the ordinary papillæ of touch.

Why this secretion, in its organization, should assume the position of the elongated tubular cells which pertain to the structure of dentine, is not here to be discussed, and it is quite enough for our purpose to say that it is a law of form perhaps not to be fully comprehended, apprehension of which would, at any rate, have but little clinical signification.

The formation of dentine completed, the covering of it with enamel begins; or rather this deposit is, to a degree, coincident with the dentinal formation. Secreted by the same pulp which forms the dentine, the same secretion, some portion finds its way into and through the primary sac. As it passes through this sac, to be moulded against the second, it is modified by the epithelial surface, which constitutes the outer face of the tunica propria; this sac, as it is understood, being a mucous membrane. Between the enamel, thus formed, and the dentine, exists the primary sac; simply the modified mucous membrane, which we first saw as overlying the papilla. The sac of mucous membrane—tunica propria, as it has been termed—continues to exist between these two hard bodies, and receives and modifies, for the support of the enamel, the liquor sanguinis found in the dentinal tubules and intertubular structure. This tunica propria is the enamel membrane. It is from this that we receive impressions of pain when it becomes exposed by a break in the continuity of enamel.

In the process of tooth development, particularly at that stage when the hard structures are being formed, a grade of vascularity is present in the external sac which seems quite to have deceived microscopic observers, as these persist in viewing such congested and thickened membrane as the agent which deposits enamel, whereas, in reality, it serves here simply as a mould, and has its permanent office and meaning in the periodonteum, which membrane a moment of reflection will show to be the persistent remainder of the tunic after the crown portion has been lost in eruption of the tooth. Enamel is analogous with epithelium. The only place where dentinal secretion comes into relation with, and under the influence of, epithelial correlation, is where it passes through the tunica propria into the moulding interspace existing between this and the tunica reflexa. A tooth at large is not a dermoid structure; the enamel of a tooth is dermoid to the extent and expression that its characteristic is received from, and is influenced by, a mucous membrane, as just described.

The growth of a tooth root, as its dentine is concerned, has precisely the history of the growth of the body. Such growth is associated with pyramidal elongation of the pulp, which, pushing upward the crown, extends upon itself the enamel membrane and tunica reflexa. This elongation, with its greater vascularity and vitality assumed as approach is made to the basement vessels,—combined with influences of a catalytic nature, existing by reason of anatomosing vessels running in from the circulation of the alveolar process,—modifies again the result obtained by the exudate passing through it from the dentinal pulp, the result being an approach to neighboring bone in the production of cementum. Analogy is found in nails and epiderm structures of similar signification and origin.

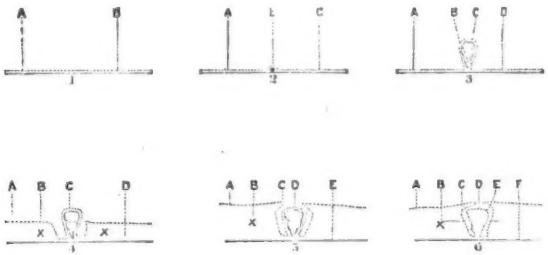
Periodonteum, as suggested, is the modified external sac, lost, of course, above the neck, as the tooth has emerged through it. See Fig. 2; all parts of a tooth are shown separately, yet in relation.

This is a very simple and easily understood explanation of tooth growth. The observations leading to the conclusions have been somewhat extensive, and the phenomena are certainly endorsed by general anatomical analogy. Let them be objected to, however, as undoubtedly they will be by the physiologist, they are irrefutable as all surgical relations with the teeth are concerned.

ILLUSTRATIONS.—These were drawn upon a blackboard, a description closely allied with the following accompanying. The tooth

selected is an inferior central incisor. Sub-fig. 1 shows two lines; A represents mucous membrane overlying B, a plane of cartilage.

FIG. I.



Sub-fig. 2 shows A, mucous membrane; C, basement cartilage; B exhibits the mucous membrane as it begins to be raised as an envelope—tunica propria—for the tooth-germ seen below it.

Sub-fig. 3 is diagrammatic of the mucous envelope—tunica propria—as it invests the germ, no reference being made in the drawing to the developing alveolar walls.

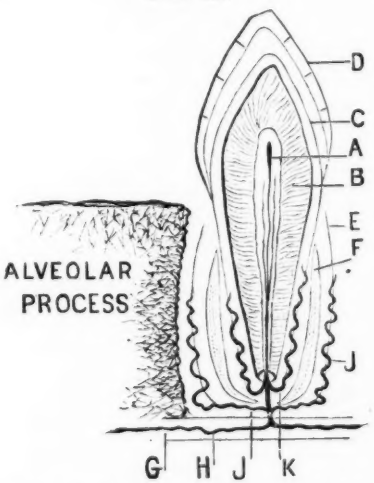
Sub-fig. 4 is diagrammatic of the idea of the manner of envelopment of germ by the second tunic—tunica reflexa. It is to be understood that ×× (B) is the growing alveolar walls, and that as this develops between the base bone and the covering of mucous membrane, it necessarily lifts the latter, but that in lifting it the tunica propria is not disturbed; hence, a second tunic, having as its eventual office the meaning of a periodonteum—*i. e.*, a bond of relationship between tooth and alveolus. The cut is to be understood as being purely diagrammatic. A, mucous membrane; B, alveolar process; C, tunica propria; D, base of jaw.

Sub-fig. 5, also diagrammatic, is designed to afford idea of a tunica reflexa about completed. The relation of the parts in this cut need alone, in order to be exactly as in nature, that the two tunicæ be in contact with each other, separated only by an intervening halitus, and that similar relation exists between tunica propria and pulp. A, mucous membrane overlying gum tissue which tissue in its turn overlies × (B) alveolar process; C, developing tunica reflexa, being part of the original plane of mucous membrane seen in Sub-fig. 1, and which here has been made to envelop the tooth-germ and its original tunic by reason of the developing alveolus of the germ represented, and of the other germs; D, tunica propria, gotten by the germ, as shown in Figs. 2, 3, and 4; E, base of jaw.

Sub-fig. 6 shows similar relations as in 5, except that here the tooth-germ is withdrawn from its envelope, and the parts stand exposed as would be shown by a transverse section. A, original mucous plane; B ×, alveolar process; C, tunica reflexa, which tunic is eventually to constitute the periodonteum; the portion above, or that portion which relates with the tooth-crown being lost because of the organ emerging through it in the act known as cutting. (The so-called ligamentum dentes is simply the thickened ring of the tunica reflexa, resultant of the remnant of the crown portion of this coat; part is absorbed, part contracts toward the root portion.) D represents the inside of the tunica propria; the whole tunic, as shown, is persistent, the portion above the line constituting the enamel membrane, the portion below the line relating the cementum and dentine. From this tunic it is, as understood, that the enamel receives its whole nourishment; it acts also as a part-feeder of the cementum.

Accepting the process of tooth development as here exhibited, it becomes understood that enamel has no special pulp as propounded by the histologists. It is also understood that it calcifies from the outside inward, and not from the inside outward. It is as well seen that it is a vital tissue nourished exactly as are other parts.

FIG. II.



A, dental pulp and its artery; B, dentine; C, tunica propria; D, enamel; E, periodonteum; F, cementum; G, canal in lower jaw; H, dental artery; J, branch of dental artery supplying periodonteum; K, branch of dental artery supplying tunica propria.

The description illustrates as well the manner and matter of periodonteal formation. It exhibits that a correct naming of that tissue would designate it alveolo-dental or alveolo-odonteal membrane.

Also it is made plain that the enamel membrane is not strictly dependent on the common pulp for its nutrition. It has another source of supply, namely, that received through the cemental portion of the tunica propria coming in its turn from the osseus-like circulation of the cementum derived from the periodonteum—*i. e.*, the persistent root portion of the tunica reflexa—from the alveolo-dental membrane and that gotten from vessels which come to it from apical vessels.

Here, gentlemen, I leave the subject, quite convinced, however, that it will not be so left by others who are to follow. I will add that I have studied the subject fully fifteen years, that I have seen every possible demonstration that microscope and micro-photograph can show, and that I am unwavering in the conviction that in the few and simple showings, I have given the true demonstration of tooth evolution. When to-night we see, as no doubt we will be shown, a half-moon-like body called the enamel pulp, be pleased to observe that the differences between that so-called pulp and the tunics standing before you on the board need for a reconciliation only that our microscopical friends develop the whole tooth in place of stopping at what is little more than its origin. To me it seems wonderful that the meaning of the tunica reflexa of the present demonstration is not recognized by the microscopist. It is quite as wonderful to them, no doubt, that I cannot see with their eyes.*

LOCAL ANÆSTHESIA.

We can speak with some authority on the benefits to be derived, in some forms of neuralgia, from the application of the following: ℞ chloral: hydr: ʒij, camphoræ ʒij. Rub well in a mortar until a fluid about the consistence of glycerine is produced, then add chloroform: ʒi and morphiæ sulph: 30 grs. and mix the whole. Paint on the course of the painful nerve. Of course we should not rely entirely on this application, but administer some of the usual antineuralgic medicines, such as quinine, quinine and iron, or arsenic, &c., internally.—*British Journal of Dental Science.*

*The editor acknowledges his obligations to the Messrs. J. B. Lippincott & Co., of Philadelphia, publishers of "Dr. Garretson's System of Oral Surgery," for kindness in loan of cuts here used.

ON CERTAIN MICROSCOPIC ELEMENTS IN PULPLESS AND GUM-DENUDED TEETH, IN THEIR RELATIONS TO THE FILLING OF ROOTS AND THE RE-ATTACHMENT OF THE GUM-TISSUE.

BY J. EDW. LINE, D. D. S., ROCHESTER, N. Y.

[Read before the Dental Society of the State of New York.]

Since the discovery by Spooner that arsenious acid properly applied to the tooth-pulp would devitalize that organ, the filling of root canals has occupied a somewhat conspicuous place in dental theory and practice. The discovery in question is said by some to mark an epoch in the history of our calling, being regarded as the dividing line between old or ancient dentistry and modern or new. But if this discovery had ended simply in the destruction of the tooth-pulp, little would have been gained beyond the cure of tooth-ache without extraction and consequent loss of the tooth; and very much would have been lost in the rapid breaking down of the now poorly nourished tooth, the destruction of the osseous support of neighboring teeth, the drainage of the system by abscesses, and the poisoning of the oral secretions—and indirectly of the whole body—by the products of these outlets of badness. Happily it did not end here. The devitalization of the tooth-pulp was followed by its removal, whole or in part, and the more or less complete filling of the root canal, after or without medication, until the perfect filling of this cavity came to be regarded as a fine art.

The material of root-filling is not so important as formerly; the method of much more importance. Some were content to fill with cotton saturated with creosote or carbolic acid; some with cotton whose meshes had been filled with oxy-chloride of zinc; some with this only or a similar plastic; some with gutta-percha; some with metals, as lead, tin or gold, the latter ribbon-like or in roll-form, or wire, or some combination of the three. It was agreed to by good and bad operators alike that roots should be filled; that they should be filled to the apex; not beyond, for that would irritate the tissues of the alveolus and give rise to tenderness to touch, or possibly to inflammation and its various endings; not short of the apex, for thus would be left a pocket to hold shreds of pulp that might soon end in death, or to retain the juices of the neighboring tissues till time and other circumstances favored their decomposition, when would result the many too-well-known ill effects.

The expert at root-filling is confronted with a case of say soreness of an incisor. The slight off-color and other circumstances indicate

death of the pulp. Casual examination reveals a gold filling on one side. Our expert now begins his quiz: "I see this tooth is filled; when was it done?" "Ten years ago." "By whom?" "Dr. Blank." "An excellent piece of work. Did he destroy the pulp?" "Yes." "And fill the root?" "Yes." Our expert is now suspicious of a defective root-filling. Dr. Blank must have filled short of the end of the root, or beyond that point, or if just to the end, his materials must have been poorly selected and as poorly packed. He then removes the filling from the cavity of decay and drills out the root-filling, or because of the worthlessness of the tooth's associates, or its own without them, extracts it and finds a root-filling as solid and as perfectly made as possible with soft gold foil packed by hand or by automatic mallet—a root-filling that goes just to, not beyond or short of, the end. He pronounces it a perfect piece of work, and as he believes that roots perfectly filled never give trouble, he is puzzled. And well he may be, for within an hour of the operation in question he is called upon to extract, preparatory to the introduction of a plate, four pulpless incisors imbedded in healthy gums and process. On splitting these teeth for examination, as is his custom, he finds incisor A to contain the ideal root-filling, satisfactory in every particular, even to the odor of carbolic acid. Incisor B also contains a root-filling, but this falls short of the end, and yet there are no signs of pericemental trouble whatever. Incisor C is also filled, but in this the filling extends beyond the end of the root a full quarter of an inch. But there is nothing more out of the way in this than in cases A and B. Incisor D contains no filling at all, and as in the three already mentioned, indications of disturbance of whatever kind at or near the apex of the root are wholly absent. If his reasoning is confined to these four teeth he concludes that a defective root-filling, or no filling at all, is just as good as the best. Or he may conclude that there is something beyond the antiseptically treated and perfectly mechanically filled root that has hitherto escaped his observation. And in this he is more than likely to be right; for while the making of the root thoroughly antiseptic and the filling of it in a mechanically perfect manner are to be desired, even if not necessary to success, there are other things that sooner or later undo the best that can be done while roots remain in their places in the jaw. What these things are will appear further on.

Whether the result of purely mechanical causes, as the tooth-brush or an ill-fitting partial plate; or the attendant or follower of causes

pathological, as a low inflammatory, a suppurative or necrotic condition, traceable to deposits of tartar or constitutional peculiarities, the stripping of the teeth of their gum-tissue means death to the more superficial and exposed portions. It has been claimed time and again, publicly by the best and quietly by some of the worst men in the profession, that the reproduction of the gum-tissue and its attachment to the tooth, or its attachment and the re-attachment of tissue already on the ground, are matters of easy accomplishment, requiring merely time, patience and skill. The best men above mentioned do this, or claim to do it, by surgical means chiefly; while others, the baser or basest extremists, rely on the application of medicaments known to domestic medicine and prescribed to innocents ever since costermongers ceased to jump upon their mothers. We are more than willing to admit the ability of any one of fair skill in other things, having a reasonably healthful and consequently hopeful case, to reproduce more or less gum-tissue, and by no other means than time, skill and a well-formed lancet. On the other hand, we are but sparingly willing to admit that in the treatment of pyorrhœa alveolaris, or Riggs' disease, some are able not only to reproduce this tissue, but also to effect its union with diseased and gum-denuded teeth. We are thus "but sparingly willing," because we believe in many of these men, in their ability, their honesty to report faithfully what they see, or think they see; and yet it is no more than fair that something more than mere statement, or say so—something approaching demonstration should make its appearance, if only to bear these worthies out in what they have said in meeting and published in the journals. We do not say that the re-attachment of the gum-tissue to the tooth is impossible of accomplishment, that it cannot be done, that it has not been done; but we do say that there are certain things and conditions of things in the way that make the operation difficult and success doubtful. What these things are, and they do not differ in any essential from those hinted at in our remarks on root-filling, will be stated when we have considered for a moment the minute anatomy of the human tooth, which we now proceed to do.

According to the every-day notion of tooth-structure, a tooth is a mass of inorganic matter traversed in different directions by matter not inorganic, as in enamel; and in places and at times organized, as in dentine and cement. According to recent views, some of which are destined to rapidly and effectively supersede many now current, a tooth is an organized body having a lace- or mesh-like structure, the

meshes being filled in with inorganic matter, principally salts of lime. If from such a body a transverse section be cut just above the highest point of the enamel, and prepared for microscopical examination, there will be seen radiating from just within the pulp cavity numerous well defined, nucleated cells, closely connected with each other by so-called lateral processes, and sending one or more long, slender processes, or soft fibers of Tomes, toward, into and through the dentinal tubuli. If one of these processes or fibers be examined, lateral or sub-processes will be seen running towards and to neighboring processes, and by means of which all primary processes or fibers are bound together. If followed straight on, this primary process, or soft fiber of Tomes, will be seen to unite directly with one or more processes of the cell of a cemental lacuna, or indirectly by processes as fine as those sent off from the sides. Following the process of the cemental cell, we pass through the nucleus or nuclei, then through one of its peripheral processes, and finally through the mesh-like structure of other cells to the peridental membrane. This gives us a string of tissue connecting the pulp through dentine and cement with the membrane lining the alveolus; and this string of tissue will exhibit two or more nuclei or centers of assimilation, development and (in early tooth history) reproduction—the three cardinal characteristics of organization, no matter where found. Such being the anatomy of this part of the tooth, of course roughly stated, we are prepared to go further and discover if possible some of the changes that may occur, and in occurring bring to naught all that has been done and suffered by operator and patient respectively.

If the pulp of a tooth die or be destroyed, the first thing is to remove the remains, cleanse the root to the apex, render it antiseptic, so far as may be, and fill well from the end down. Suppose this done and the root does well for say ten years, as in our expert's case, and then, without apparent cause or provocation, becomes tender, aches, and after a few days develops an alveolar abscess. To what shall the failure be attributed? To mechanical interference of any kind? To accident? Neither of these. To the operator? No, for we know that he did his work well. What then? The answer is short: Death and decomposition of the contents of the dentinal tubuli, whole or in part, and the transmission of the irritation to and through the cemental cells to the peridental membrane, giving rise to inflammation and ending in abscess. It was at or near the pulp cavity that the trouble began, and it is here that a section from a tooth of the char-

acter described shows a difference in color, in the contents of the tubuli, in refractive power; and it is here that we find the line of demarkation, that line that sets off the living from the dead—what may be called the dead-line. It existed at the time of the preparation of the root for filling. On one side was living tissue, on the other more or less dead tissue, antiseptically soaked. But at the time in question death took a fresh start and set the line deeper in the dentine, or even in the cement close to the peridental membrane, and with the result stated. Without knowing why, attempts have been made to defer or prevent decomposition. The habit some dentists have of reaming roots from beginning to end is a good one, for by this means the dead contents of the inner ends of the tubuli and the diseased intertubular tissue are removed; but even then the dead-line may be a little beyond the reamed portion—just far enough to save a little dead material for future mischief.

Again, in the case of a gum-denuded tooth, we find dead tissue near the surface of the root, and in some cases, so far into the cementum as to involve the contents of the lacunæ. This being the case, what is to bridge the chasm between the gums, old or recently formed, and the contents of the lacunæ or (in the neck) the tubuli? It is claimed that the root should be scraped, cut away, excised, and the gum lacerated, and that then there will occur an exudation of plastic material which, undergoing organization, will re-establish nutritive and other relations between the tooth and its environment. Where this happens, circumstances must be favorable indeed. That it does not, cannot happen often, is apparent from the fact that a broad dead-line, a chasm must be crossed; and living tissue separated by such lowly organized structures as cement and dentine, and a thick film of mixed oral secretion, can rarely, if ever, come in contact—and union without contact of some kind and some thing is simply impossible.

In presenting these thoughts it is not with the intention of excusing in any way any man for doing questionable work, but rather to put him on his guard against those who, in the face of the nature of things, claim too much; and also to furnish him with a few facts in regard to things always beyond his control, and liable at any time to undo what has cost him long hours of hard and honest labor.

REMARKS OF DR. C F. TERRY, OF MILAN, ITALY, BEFORE THE LATE MEETING OF THE NEW ENGLAND DENTAL SOCIETY, HELD AT PROVIDENCE, R. I.

Through the kindness of Dr. Dudley, I received an invitation to attend this meeting, and it being the first dental meeting I have ever had the pleasure of attending in my own country, it will not be necessary to tell you how much I enjoy it. Thinking also that a few words in reference to the condition of the teeth in that part of Europe in which I established myself for the purpose of practicing dentistry more than twenty years ago may interest you, I volunteer these remarks.

Before going abroad, I had an idea that teeth were worse in the United States than in any other civilized part of the world, and had heard men in our profession, as well as others, express the same opinion. During the first three months after my arrival in Zurich, Switzerland, while waiting to pass my examination and receive permission from the authorities to practice my profession in their city, I had considerable time to walk about Zurich and the neighboring country and make observations. I was astonished to find that both in the city and country, among rich and poor, the condition of the teeth of the inhabitants was worse than in that part of my own country from whence I came. After years of practice in Zurich I found nothing to convince me that these first observations and conclusions were incorrect.

I was told by intelligent Swiss people (and the Swiss are generally well educated and intelligent), that the air and water of that part of the country was the cause of the early decay of the teeth. This idea prevails generally even among scientific men. Being often asked by patients if this was not the cause of decay, I generally answered that if the rats and mice living in the same house with us and taking the same water and air, also if the animals running wild in the neighboring fields and woods, choosing their food instinctively, were likewise affected with bad teeth, I should be inclined to believe this was the cause, but, so far as I have been able to ascertain, the teeth of these animals are just as free from decay here as in any other part of the world. Further, if the water and air were of such a nature as to cause fevers, or other diseases, that indirectly the teeth would suffer, but so far as my observation had enabled me to judge there was nothing in the air and water of Zurich and its neighborhood which could affect the teeth directly, as they claimed.

My argument for years has been that the two extremes of diet, too rich food or too poor food, are equally injurious to the teeth as well as health; and I think I found the proof of the correctness of this argument in the state of the teeth in the canton of Zurich. The poor in this canton are thrifty and economical, and generally succeed in laying up a little money for old age. Both men and women work in the fields and factories, therefore the women cannot devote much time to cookery. They rarely understand preparing a wholesome meal, even if they have the materials, and live upon what I consider a crude mess. Coffee is used extensively, also white bread—never bread made from unbolted wheat flour. Soup is a daily dish, so that they almost always boil their meat instead of roasting it. This boiled meat is not eaten, however, every day, and is seldom of the best quality, as meat is expensive. Wine made from the sour grapes of that part of the country is drunk extensively. It is something like vinegar. To drink this wine with a diet wanting in nourishment is the last thing they should do. It takes the phosphate of lime from their systems, instead of adding that which they need.

The habit of floating the food into the stomach on some kind of liquid, as a canal boat floats into the lock, is more common here, I think, than in other parts of the world. Perhaps on this account nature, finding no use for the teeth, tries to dispose of them.

The climate of this part of Switzerland is damp, foggy and rainy. I think there are a less number of hours of sunshine there, on the whole, during the year, than are enjoyed in most any other part of Europe.

The rich and educated people live about as they do in other parts of the world. Were I to judge from the number of confectioners' shops, I should say that they indulged in a good deal of that kind of food, as well as in a good deal of wine. I suppose fine white bread has been used longer in Zurich than in any other part of the world, as it was in this place that the fine silk bolter was invented, if I am informed correctly, with which millers were enabled to produce the superfine flour. Before this, a wire gauze bolter was used. This is interesting when we take into consideration to what extent the question of the use of Graham bread, and its influence upon the human teeth, has been discussed. I believe the teeth in this part of Switzeland are worse than in any other part of the world; they are so soft and chalky that it is difficult for a dentist to find a foundation on which to build a reputation.

It is claimed by some that climate has a great influence on the teeth, and that in the sunny South mouths partake of the perfect nature of the climate. I was therefore astonished to find in San Remo, Italy, on the Mediterranean coast—where I have practiced more or less for ten winters—that the teeth of the natives, rich as well as poor, were almost as bad as those in Zurich and its neighborhood. The climate of San Remo is dry. Statistics prove that there are a less number of rainy days there than in any other part of Europe. The place is a winter resort for consumptives. The thermometer seldom falls below 50° Fahrenheit, and then only three or four times during the season. The inhabitants are therefore seldom without fresh air, winter or summer, night or day, as their windows can be always open.

The San Remese are said to be among the most industrious and thrifty of Italians. Men and women work in the fields, the women generally doing the more laborious parts of the work and finding no time to take care of their children, homes or cooking. Their food is of a miserable kind, badly prepared, and of course they and their families are poorly nourished. As the lemon culture succeeds in this part of Italy, the children no doubt indulge in this sour fruit at an early age; and as their teeth are not in a normal condition they have not the resisting power necessary to ward off the attacks of the acid of the lemon, therefore soon decay. They say there, when asked the cause of the rapid decay of teeth, that it is the sea air and water. Wine is a common beverage, and is not as good as one would expect in such a climate. It is what an American, who has not been in the habit of drinking dry wines, would consider vinegar. These dry wines —this is the name for wines which are not sweet—may be wholesome for rich people who indulge in rich food, but I believe they are injurious to that class of people who take too little nourishment, as the poor on the continent usually do.

At San Remo neither rich nor poor take any care of their teeth; they would expect them to melt away instantly if they should attempt to clean them with a brush. I have looked into the mouths of grown people and children living on the hills near San Remo and I have not found a mouth, so far, where the assistance of a dentist was not necessary; and, as far as my experience goes, this is the case among the peasants in the mountains of Switzerland. To me, San Remo and Zurich have been particularly interesting, as I have thought and read a great deal about the causes of disease in the human system, and particularly in the teeth. I have lived in good climates and bad climates,

and the more experience I have the more I am convinced that what we put into our stomachs has more influence upon our health, and particularly on our teeth, than climate. The advantages of living in a warm, sunny climate are, that people can live with less artificial heat, are contented with less and with simpler food, and have less appetite for strong drinks. It is well known that there is far less drunkenness in warm climates, where wine is the common beverage, than in colder climates.

The Italians, notwithstanding that they grow a good deal of cheap wine, are light drinkers compared with Northerners, and are not large eaters. I have observed that a common complaint in all countries where I have traveled is, acidity of the stomach. In fact, I find everywhere it is a fermenting age. Nearly everything is fermented before it is put into the stomach and ferments again after it gets there. Perfect teeth cannot be expected when our bodies are nourished after this abnormal fashion.

I think teeth have degenerated on the continent very much in the last twenty years; caused, no doubt, by the increased indulgence in artificially prepared food and drinks. Over-education, over-work and nervous strain, which are claimed by some to be among the principal causes of decay of the teeth, certainly cannot be applied to the Italians of San Remo, either rich or poor, who neither over-study, over-work nor over-think. The educated Swiss people are both workers and thinkers, but rapid decay of the teeth appears to be just as common among the uneducated peasants of this country as among the former class.

The poor and middle classes in Switzerland know very little about taking care of their teeth, and I doubt that they would spend money enough to have them cared for properly, as they consider this a luxury only for the aristocracy and millionaires. The rich in Switzerland are disposed to spend money on their teeth as soon as they ascertain that they can be preserved by attention. In general on the continent it is only the aristocracy or very rich who take much interest in this branch of science.

The best Swiss dentists are generally very intelligent and well educated men and are as good, if not better, than European dentists in general.

THE GERM THEORY "MORTALLY WOUNDED."

BY C. S. BOYNTON, M. D.

It is a sad thing to be mortally wounded! Dr. Gregg, of Buffalo, claims to have "done the job" for the germ theory of disease. Some of us who for years have thought we could see glimmerings of truth unfolding as each successive discovery was proclaimed and confirmed by subsequent experiment, are not willing to have our names placed on the list of wounded or missing until there is a fair and impartial hearing in the case, and we know for certain whether we have been hit or not. As reported by the papers, his experiment was as follows:

"Dr. Gregg, of Buffalo, has been boiling pure fibrine several hours a day for ten days. He then baked it slowly in an oven three hours; next, burned it black and pulverized it, and finally treated it with absolute alcohol. The powder of this burned mass gave millions of the so-called spherical bacteria or microcoal, thousands of them in a torula form, or chains, and hundreds of 'bacterium termo.' In comparing these forms under an eighth objective with those in blood that have been rotting under warmth three months, they appear identical in every particular. This the doctor regards as the absolute proof of all he has claimed about these forms of so-called bacteria in disease being nothing but granules and pieces of fibrine. The said granules and pieces also show violent motion under the proper conditions, thus suggesting their being polarized and moved by electrical action."

He takes pure fibrine, from what source is not stated, but we presume from fresh drawn blood. Blood freshly drawn from the veins and beaten up while cooling, does not coagulate; the fibrine it contains is *insoluble*, and exists as a *thread-like* coherent mass which, when kneaded for some time in water, becomes finally white and, after drying, resembles muscular fiber. It may be regarded as half-formed flesh. So, for the matter of this experiment, he might as well have taken a bit of beefsteak or leather. This he boiled several hours a day for ten days. Boiling an insoluble substance for ten days would amount to nothing only steralize the liquid in which the substance was contained, and not this, unless the boiling was conducted in a closed chamber. Then baked slowly in an oven for three hours. What for? If it was to be burned at last, what need of this step? Next, it was burned black and pulverized. What have we at this stage of the experiment? Simply animal charcoal—"Only this, and nothing more;" and please bear in mind, charcoal made from a *thread-like*

mass—is it strange that, on viewing this, he should see short rods and round grains in the powder? We can only say, as did the Irishman on viewing Niagara Falls, when his attention was called to the immense volume of water pouring over its rocky dam into the abyss below, "Well, what's to hinder."

To one not versed in the life history of the bacteria, they might be taken for identical forms; but Dr. G. can watch these same "charcoal organisms" till his vertebræ becomes anchylosed and his eye grows dim with age, and never see one of his lively "electrical varmints" reproduce itself by division, or cast off a single spore. It has long ago been decided that the only standard by which the life of these organisms can be proven is the power of reproduction.

We hope to hear from Dr. G. again, and if his charcoal colony should "wax fat and multiply," then the Heterogenesists have made a good point and gained a leader. But as the case now stands, we can only copy the notice of the *Scientific and Literary Gossip*, and leave the Doctor to the mercy of an educated public.

"Dr. R. R. Gregg, of Buffalo, announces in the *Medical Advance* that he has mortally wounded the germ theory of disease. When will the time come when the medical profession will have a scientific education?"

A REVIEW OF PROF. GARRETSON'S ADDRESS.

BY DR. J. L. WILLIAMS, NEW HAVEN, CONN.*

Dr. Williams prefaced his lecture on Embryology by a brief reference to Prof. Garretson's address. He said: "My position, as I stand before you to-night, is not an enviable one. That I should follow, in the same day, with a paper which must necessarily go over at least a portion of the field traversed by one whose life is already laden with the rich fruitage of years, whose reputation is not only national but world-wide, must seem like presumption. To Prof. Garretson, the perfect gentleman, the professional man who probably stands without a rival in his specialty, I accord my most profound respect, with the consciousness that words of mine can hardly add to the high esteem in which he is justly held by his admiring professional brethren. But we must not allow ourselves to be blinded by

*As Dr. Williams' lecture, which will appear in full and copiously illustrated in the *Cosmos*, was not written as a direct reply to Prof. Garretson, he has prepared at our request this brief review of Prof. Garretson's address.—ED.

rare personal accomplishments, and my love for truth so far outranks my deference for men, that I say at the outset, frankly, but respectfully, that it has never before been my lot in any dental convention to listen to such a recital of misapprehensions and pseudo-philosophic vagaries as was detailed by the gentleman who addressed you this afternoon upon the subject of Dentition. And this is all the more to be regretted because the position which the gentleman occupies and the manner of his expression seems to put a premium upon a lack of knowledge concerning this most important subject."

Prof. Garretson's statement, in defining his position, that he desired his audience to understand that he proposed to entrench himself in a position from which there could be no possible retreat, or, in other words, that he considered his knowledge upon this subject so nearly infallible that he wished to make no provision for any change of opinion which sometimes grows out of a clearer apprehension arising from newly-acquired facts, was in itself an evidence of weakness and of that intellectual arrogance of which Mrs. Browning says:

> "God laughs in heaven when any man
> Says 'Here I'm learned; this, I understand;
> In that I am never caught at fault or doubt.'"

Prof. Garretson's allusion to the alleged confusion among microscopists, concerning the correct interpretation of what is seen under the microscope, in no way detracts from the force of the fact that no histologist of recognized ability of the present day has ever seen anything remotely resembling his description of the development of a tooth. His total lack of familiarity with the details of microscopic work appears in his use of terms, as when he speaks of photo-micrographs as "micro-photographs."

In speaking of the "primitive dental groove," the supposed existence of which was long ago proved a fallacy, he says:

"It is proposed to let the subject evolve for itself demonstration of the existence of a primitive dental groove, seeing that if an adult jaw be taken, and the inter-dental septi be cut away, there is found a big groove; and a big groove implies gradual enlargement of one which at some time must have been so little that no microscope could see it. Mucous membrane does not dip down, it dips up; this difference, as it is trusted the demonstration will show, is greater than that between tweedle-dum and tweedle-dee."

Now I venture the assertion that if these words were to be quoted in the presence of any one engaged in practical embryological inves-

tigation, he would pronounce it ludicrous nonsense. There is expressed an ignorance of the first principles of embryological development, which is almost childlike in its innocence. If any idea is implied, it is the old notion of the complete oak with its roots, branches and leaves existing fully formed, but in miniature, in the acorn. Embryological development does not consist in the gradual *enlargement* of parts which have form in the germ. Organs and parts take form from a mass of embryonal corpuscles according to laws of spiritual type and progressive development. He further says:

"When first seen, a dental germ is microscopic. When seen in that expression which is the meaning of its organic relations, it has surrounded itself with tunica, with dentine, with cementum, and with enamel. Dentine, cementum and enamel are resultant of a common secretion, and this secretion lies with the dental pulp. There is no enamel pulp as propounded, and thought to be shown, by the microscopist."

The statement that the liver secretes bile and gastric juice and saliva, and that cartilage nowhere exists prior to the formation of bone, would be quite as consistent, and have quite as much foundation in fact.

The truth is, the dentinal germ never makes its appearance until after the formation of the enamel pulp or organ; in fact, the beginning of its existence depends upon the presence of this enamel organ. The different stages in the formation of a tooth preceding the appearance of the dentinal germ may be as clearly seen as the capillary circulation in the web of a frog's foot.

The gentleman, in speaking of the continued development of the tooth and surrounding tissues, said:

"Corresponding with the growth of a papilla is that of its alveolar envelope. As such envelope is of sub-mucous nature, being an organization arising out of cells existing between the mucous membrane and plate of jaw, among which cells the germ lies, it is to be recognized that as this increases about the germ it necessarily carries around it a second coat, or tunic; tunica reflexa it is not unwarrantable to call it. This now becomes the dental relation; a germ, originally microscopic, has enlarged until it stands in shape and size the representative of a tooth; this germ is enveloped in a double sac."

This is all purely imaginary, as can be shown by even a cursory examination of actual specimens under the microscope.

Neither a first or a second coat or tunic of mucous membrane ("*tunica propria and tunica reflexa*") ever existed in connection with the development of the teeth In the manner described, except in

the poetic imagination of Prof. Garretson. I challenge him to produce a single specimen with all of the tissues in their proper position which shows anything resembling this "folding up" of the mucous membrane, as illustrated and described by him. There is neither "folding up" nor "folding down" of mucous membrane in the formation of the tooth-germ. The process by which a tooth is evolved begins in the cuboidal layer of epithelial cells, directly over the position which will be occupied by the future jaw, by a rapid proliferation and increase in size of these cells. This increased activity of the cells at this point slightly elevates the surface layer of cells, producing a noticeable ridge. At the same time, the columnar or lower layer of epithelial cells is pushed downward into the embryonal dermal tissue. These changes occur before the appearance of either the enamel organ or dentinal germ. From the inside of the sheet of columnar cells which has been pushed downward into the jaw there grows out a thin band or lamina (I am speaking now of the inferior maxilla), and from the edge of this band there grow downwards the epithelial *cords*, the enlarged and invaginated ends of which constitute the enamel organ. It is thus seen that there are no such movements of the mucous membrane as those described by Prof. Garretson. Neither is the tooth-germ ever directly enveloped or "encapsuled" by mucous membrane. Soon after the appearance of the dentinal germ, the embryonal corpuscles at its base and sides begin to assume a spindle-shaped form, which is the beginning of the tooth sac. This sac is developed from below upwards until it completely closes in the growing tooth-germ. These processes have been carefully studied from sections of fœtal jaws in the various stages of development. Prof. Andrews, of Cambridge, who has one of the finest collections of microscopic slides illustrating the development of teeth of which I have any knowledge, has been for several years carefully studying this subject. His views are perfectly in harmony with my own, as are those of every practical histologist who has given any considerable time to the study of this subject.

One of the most egregious mistakes which Prof. Garretson makes, and one which can be easily shown to any person who can see anything through a microscope, appears in his conception of enamel formation. He says:

"Accepting the process of tooth development as here exhibited, it becomes understood that enamel has no special pulp as propounded by the histologists. It is also understood that it calcifies from the outside inward, and not from the inside outward."

The enamel pulp is quite as large and *more* conspicuous during the early stages of the development of a tooth than the dentinal pulp. The calcification *does not* proceed from without inward, as any one must know who has ever seen an actual specimen showing the commencement of the formation of enamel and dentine. Calcification begins at the point where the dentinal elements (*odontoblasts*) meet the enamel elements (*ameloblasts*). This line is represented by the position of the hypothetical *membrana præformation* of Raschkow and the *tunica propria* of Garretson. The first narrow line of enamel which appears lies close to the dentine, the calcification of which begins shortly before that of the enamel. As calcification proceeds, this line (longitudinal section of the tooth-germ showing it as a line) increases in width, the enamel calcifying *outwards* and the dentine *inwards*. This fact alone is sufficient to show the error of Prof. Garretson's theory.

In truth, it is not a question of opinion at all, as Prof. Garretson seeks to show, but one of fact. On his side, it is a presentation of misinterpreted facts, the result of a lack of carefully conducted original investigations. We present actual sections of fœtal jaws illustrating every process which we describe. Prof. Garretson says that he has seen "every possible demonstration that microscope and *micro-photograph* (*?*) can show;" that he has "studied the subject fully fifteen years," and as the results of what most of us would regard as a super-human effort, that of witnessing "every possible demonstration," he has evolved his so-called "philosophic system" of tooth development.

Of course I cannot expect that anything which I may say or show can have any value to one who has considered every possible condition and seen "every possible demonstration," but I do hope that I have said sufficient to convince any one who may be desirous of studying this subject, that it is not safe to follow a "philosophic system" when in search of scientific truth.

Cheeky advertisements are not to be found in America alone; one specimen appears in a small local sheet in Southern Germany: Thousand mark we pay to every one whoever shall get toothache again during (by) the use of, etc., etc. The wording, as the addition in parentheses shows, is ambiguous, and the thousand mark will never be paid.—Tout comme chez nous! Just as at home!

SOCIETIES.

THE TWENTY-NINTH ANNUAL MEETING OF THE AMERICAN DENTAL CONVENTION, HELD AT THE TOWN HALL, SARATOGA SPRINGS, N. Y., AUGUST 14, 15, AND 16, 1883.

(Continued from page 356.)

Paper of Dr. Rynear. (See November number.)

PRESIDENT: I see Dr. Butler, who has had a great experience in these things. I would invite him to give us some of his experience.

Dr. BUTLER: In regard to these metal crowns, I have had some experience in their construction and also in their adjustment, and I appreciate their importance or rather their value. This mode of constructing them is a very great advance over the old method: namely, to raise the whole crown by the old way of impactment of gold. This was a very tedious thing to the operator; patients also appreciate it. I regard this as a better mode, far less laborious all the way round. And if you want to make it stronger by inserting a pin in the pulp canal, you have a stronger thing than by the old mode of raising by the impactment of gold. I am glad that this gentleman has presented the matter here, and I wish that they might be constructed so that we could buy them instead of having to resort to the laboratory and there working them out in the old mode. My mode of doing has been to fit a band and solder on it either platina or gold. This new method does away with all that kind of labor, and if we have two or three sizes, as he suggested, we will be able to fit the caps with very little trouble. One word further in reference to cement fillings: I never have drilled a hole to allow the excess to escape, and I think there is no necessity for it. You recognize that all persons that speak of set crowns will impress upon you the necessity of packing them tight around the neck where the edge goes under the gum. This driving of any band so that it strikes on the alveolar process or comes anywhere near, is a terrible mistake in almost all these cases; you may be sure in all these cases to get recession of the gums, you interfere with the tissues, put something there that is not congenial; I do not believe in such things; I believe it does damage. But if you do not put in too much, and we suppose the operator has a reasonable amount of judgment, or he would not be much of an operator—if you adjust the cap quickly, the small amount escaping is readily removed; and the very fact that you have something that you can drive down gives

you a certainty that the little interstices that you cannot see are filled up; I never made a point for the escape of the excess.

Dr. RYNEAR: I must concur with Dr. Butler that it is not essential, but with persons not familiar with these operations by long practice, it is a prudential way of doing it. I omitted to make the statement that where a portion of the crown remains, it is seldom necessary to put a screw in the root; the least under-cut will retain a crown in position.

Dr. BUTLER: Where I believe this crown of most value is in cases where you may save the pulp, as you would with an ordinary filling.

Dr. PATRICK: I would say that for this metallic crown you must have a community to wear them. Particularly where the funds are limited, as in the South, I could not get a single lady to wear an artificial crown; I saw one lady with the teeth built up of gold very beautifully, but she was so dissatisfied that she had them extracted. I have never found that phosphates could keep a crown in position; phosphates will deteriorate where they come near the gum; I have seen them last one or two years, but never longer. I have seen preparations of gold and platinum made by Dr. Black of California. I was then in Dr. McKellops' office, in St. Louis. A lady came into the office and said: "I do not like the gold to show; my husband objects to it"; he examined the case and could not do better, but he thought he could produce a material that would wear better. He took gold and platina foil, number 40, and filled the tooth with it; at a distance of twenty feet you could hardly distinguish it from the real tooth; he has three numbers—I think numbers 30, 40 and 80. It is so hard that it will cut the hardest file, and the only thing I could suggest to the gentlemen working with crowns is a mixture of that kind.

Dr. RYNEAR: The only material of that kind is manufactured by Wilmer, and I think it is the same; it is very much like platina. These crowns can also be made of platina, and those who desire platina can use them. I must say my individual experience with those crowns dates back over two years. I have used them extensively in my own practice; many are worn, and I never yet had any come back; many are now in the mouth four years, put in the manner I suggested, and they present the appearance as when first put in.

Dr. PATRICK: My experience is in my southern practice. I have never seen phosphates last when coming near the gum; whether this is due to a peculiar condition of the saliva, I cannot say.

Dr. LOVEJOY: Every gentleman in the profession will agree with Dr. Patrick that the oxyphosphates do not stand. I would like the experience of Dr. Butler about the Büttner crowns, which I think best for front teeth; but these are driven up with a mallet.

Dr. RYNEAR: One reason why I was encouraged to make this cap, notwithstanding the fact that Dr. Büttner's presented a very ingenious crown, is the fact that his crown is not universally adapted.

Dr. F. Y. CLARK: Did Dr. Rynear state that he put solder inside when they did not fit?

Dr. RYNEAR: A little solder may be put into the interior preparatory to the removing of a portion, to prevent cutting through the crown while getting the proper occlusion.

Dr. LOVEJOY: The principle is the same as that of the Büttner crown; all this is done outside the mouth.

Dr. PATRICK: I am much indebted to Dr. Rynear for this crown; it seems to be an advance.

Dr. RYNEAR: I am very much obliged that you say so. The crowns are stamped from an entire piece of gold; no solder is used. I have found that in molars the circumference of the crown is about equal to the circumference of the neck of the tooth where the root bifurcates, and it will be seldom necessary to make a cut. I have also discovered that the neck of the roots in the front teeth resemble each other, as the crowns resemble one another, and I believe a variety of three of these could be made which would meet all the necessary requisites in this direction. The utility of these crowns consists in the easy manner in which they can be put on; we shape the root as we desire; then we select one of these little caps; it is taken right to the mouth of the patient to its place, and with a burnishing instrument we fit it to the root; the gold is soft, and can be easily shaped; all foreign substance must be removed from the margin of the gum.

Dr. PATRICK: I would like to give the information about a gum to attach two pieces of gold or gold and porcelain; the best is six parts of mastic and one of wax; it has no sticking property and holds perfectly tight.

Dr. F. Y. CLARK: I can give something in regard to crowns; I have been in the habit of making them for two years. Dr. Rynear has a metallic dye by which the crowns can be stamped beautifully. Instead of applying solder I would take gold amalgam, and you can solder with that very easily, and put on my ring, apply my gold amalgam, and rub so that a perfect amalgamation between the gold and

cap has taken place. When that has hardened, I put the cap in place; you can drive the mercury off by heat, or, if you wish to apply solder, you can do so after driving off the mercury; the cap will hold very firmly; the oxyphosphate will not permeate between that and the tooth. Instead of one crown, I have used two; I fit a rim down over the tooth; it has half the width I intend the crown to have. I then put the cap right over; you have in this way a ring open at the top; you can fill as you please. If you use amalgams, you can pack as you please, and you can see everything perfectly; then you put on the oxyphosphates or whatever you choose, and tell your patient to bring his jaws together; thus you get a perfect antagonism of both jaws. This has been to me the most satisfactory thing; the advantage is that I can look in at the top and see where the imperfections are; then I can put on the top this beautiful crown. It will be quite an advantage if those can be had. Those caps I should think would stick to my rings.

Dr. WHITE: In making these bands I find the easiest way is with a thread of platina. After getting your impression, take a thread of platina and pass it around the tooth and then flow in pure gold, thus giving a band on which you may adapt your porcelain crown on the Richmond plan or any other. I believe the band is better adapted and will give a closer fit than anything; I have put on a number in this way.

Dr. PATRICK: You wrap your wire around the root?

Dr. WHITE: Around the impression of the root, flowing pure gold around the platina.

Dr. RYNEAR: I would rather my crowns would not fit too perfectly; I would rather they should not be tight at the neck.

Dr. WHITE: I would like the objections to a perfect fit; that is just what we seem to be in need of.

Dr. RYNEAR: I don't mind the perfect fit if you can do it without risk of injuring the cementum of the tooth.

PRESIDENT: We have a gentleman of very large experience among us, Dr. Colidge. He must give us some information.

Dr. COLIDGE: I simply would say that I have been unable to say or do anything because of slight temporary neuralgic infirmity.

Dr. LOVEJOY: Dr. Baker, of Boston, takes a very thin sheet of copper, as thin as possible; he takes next an excavator and runs it around the edge of the gum; then he takes a strip of copper and cuts it three-fourths of an inch wide and bends it around the gum; he bur-

nishes it, ties with white floss silk; then he takes plaster and puts it into the copper cap; lets it set, and after it has set he removes it, and heating it over a spirit lamp puts Babbitt metal into it. Thus you get a cast of the root in Babbitt metal.

Dr. CLARK: I find I can never get a correct impression in the old way.

Dr. LOVEJOY: You get a metallic fit in a few minutes in this way of Dr. Baker.

Dr. BUTLER: I perhaps ought to say a word. Dr. Patrick spoke of the objections to the use of phosphates along the margin of the gum. I recognize that as being true, and have endeavored to overcome the difficulty, and I think I have met with a good degree of success. In setting crowns in this manner, I use a solution of gutta-percha and chloroform instead of oxyphosphate cement; for we all know that the fluids of the mouth do not affect that very much, and it stands for three or four years; there is nothing antagonistic between it and the soft tissues. It seems to be tolerated very kindly.

Afternoon Session, opened at 4 P. M.

Dr. Allen of New York opens the discussion on Pathology and Diagnosis, in which he sets forth the great importance of a careful and correct diagnosis in all cases of pathological conditions we are called upon to treat, many of which are of dark and obscure origin and demand an educated eye and apprehension to fully comprehend.

Dr. CLARK: Anything will be valuable that will throw light on hidden diseases, and I cannot let the paper pass without some discussion.

Prof. MAYR: Not every dentist is a thoroughly educated physician. To him the diagnosis of disease is of less importance than the mere symptomatic treatment of the dental symptoms, but I would like to say a few words about the recklessness with which some dentists talk about scrofula and syphilis. Very many seem to labor under the prejudice—it cannot be called conviction—that scrofula and syphilis have some direct connection. Considering the stain with which all syphilitic diseases are burdened, the stain of unlawful and even criminal sexual intercourse, a dentist cannot be too careful in throwing such a blame upon individuals who may be entirely innocent. *Scrofula has nothing to do whatever with syphilis.* Scrofula is a sluggishness in the transition from the embryonal condition of the tissues to the normal condition; this is very different in hereditary syphilis. We find rather a too quick passage from the embryonal condition to the normal condi-

tion. The teeth of scrofulous persons are invariably well developed as far as the development alone is concerned, but they will not remain so; they are not made up stable enough, and all external influences affect them too quickly; hence, the great frailty of the teeth of scrofulous individuals. Teeth in persons with hereditary syphilis, on the other hand, may be developed imperfectly and with characteristic marks, but they are resistant, and not any more liable to decay than the teeth in other persons. The causes of scrofula are very dark, but the following results have been gathered from very careful statistics, quoted in Niemeyer's pathology: Scrofula in childhood has been found to affect; first, children of the parents who had cancers at the time of generation of the children; second, children of parents who were suffering from advanced tuberculosis; third, children of parents who were suffering from any chronic ailment that affects the entire nutrition of their bodies. Every child generated in the third stage of acquired syphilis in parents is free from syphilis, but may show scrofula. Hence, anything which may produce a weak condition in the bodies of parents is apt to manifest itself in the form of scrofula in children. The period during which parents may transmit syphilis to their children is fortunately very limited, and with judicious treatment may not exceed two years; while the period during which scrofula may be produced in the children is very much longer. This explains the great difference in the number of syphilitic children and of scrofulous children. One will meet with many a practitioner who never had patients suffering with hereditary syphilis, while the number of scrofulous children is almost as great as the number of healthy ones—perfectly in accordance with the frequency of the occurrence of syphilis and weak constitutions in parents. Syphilis is comparatively very rare in America; that is, the real, genuine syphilis. No one, who is a scientifically educated man, will for a moment maintain at present that the common soft chancre has anything to do with syphilis. It is true, it may be unpleasant, it may become gangrenous and destructive, but it is not syphilis. After a person is cured from this benignant and mild affection, he is as well as he was before. It is of hardly more importance than a boil, and not of as much importance as an abscess. Syphilis, on the other hand, begins with the specific induration, having a time of incubation of about three weeks, and it is invariably followed by enlargement of the glands. However free a person may be from plainly visible manifestations of syphilis, the enlarged glands will unmistakably show that he is still infected. The

most characteristic gland in this respect is one of the cervical glands, about two inches behind the ear, which retains its swelling most persistently. Syphilitically swelled glands may be easily distinguished from the glands swollen during the course of scrofula, by the first being hard, painless and only slightly swelled; while the latter generally swell to huge size, are painful, and soon become transformed into abscesses and sores. I think the "duality of syphilis" is now well established; that is, chancre may be one of the varieties of venereal diseases, but it will never show itself in the offspring or in secondary affections. If we consider how easily one word wrongly uttered may ruin a family and do irreparable damage, those dentists who, without very strong proof, ascribe scrofula to syphilis, seem to me more than reckless; it is criminal to say so without strong proof. Your patients do not always know how much a dentist knows or does not know, and the latter had better be careful.

Dr. CLARK: One of the most valuable discoveries made with the aid of the microscope has been in the line of the discovery of bacteria in syphilitic lymph. There is no longer any necessity for being in doubt as to the presence of that parasite in the mouth of a syphilitic person. You can examine the serum in the speck and you will find bacterium syphiliticum; it is one of the most valuable discoveries that has been made. This germ has not yet been sufficiently separated from others occurring in the mouth; but when you have once seen it, you will easily recognize it again. Some have contended that it resembles the virus in the rattlesnake, and other writers put it under the head of micrococci; it is also very similar to vaccine virus. With a $\frac{1}{10}$ objective you can very easily see this parasite. You will see a germ you have not seen before, but it requires careful study, and I want to speak very carefully about the matter, otherwise you might take it for another species of the parasites that occur in the mouth.

Dr. LOVEJOY: Is the germ seen in the chancre and during the second stage?

Dr. CLARK: Only in the second stage of constitutional syphilis.

Dr. LOVEJOY: I would like to relate a case, though I suppose most of the gentlemen are familiar with the circumstances. I was doing a piece of work for a young lady, and her sister occupied a seat some distance removed, and while I was filling the tooth she seemed to be troubled with her toe. My patient turned around and said, "Is that toe still troubling you?" "Yes, and I want it cut off." While filling the tooth, I questioned and, by inquiry, found out that the pain was

first in the arm and then in the shoulder. As soon as I had concluded, I requested her to take a seat in the chair. She said she had never had anything done. "I never had toothache. I have about as good teeth as the average, and as I ever want." Her sister finally joining me, she seated herself. I rarely ever saw a finer set of teeth. I could not find a speck of decay. The teeth were regular, and I was about giving up when I noticed that one of the wisdom teeth was missing,—She was 25 or 26 years old. I asked her if she had one extracted; she said no, and I said to her: you have still one to get. I noted a speck in the gum and cut in with the probes, and I never before saw such an effect produced; the wisdom tooth had impacted against the other molar. I heard nothing more of the case for about a week, when her Dr. called and questioned me about the case. It had been under treatment for six months for neuralgic and other troubles. Two weeks after, the sister called on me and told me she had no further pain in her toe. I do not think I have seen any other case where the pain was so far away from the cause of the pain.

Dr. READ: I would like to know if any of the gentlemen have met with a case of deafness caused by the wisdom teeth crowding that way, and producing a continual ringing in the ears for years from exostosis. I had a case which was relieved entirely by drawing the wisdom teeth.

Dr. ALLEN; I can say, yes sir; I had a case where the eye was considerably affected by it.

Dr. WHITE: I remember a very interesting case bearing on this subject. The patient is now dead, but was very well known. He was an old gentleman, and was suffering very much with his left eye. He was under treatment for a long time, and every remedy seemed to fail. The old gentleman got to be worse and worse; seemed to be failing generally. He was under the treatment of one of the most eminent physicians. The doctor sent him to Saratoga. The old gentleman spent a couple of months here without benefit. He was returning to Savannah, but died on the passage. That was at least reported, but it proved incorrect. He came into my office and was wearing a bandage over the eye with the prospect of losing the sight. He was suffering with necrosis of the lower jaw. I advised the removal of the teeth; they were very loose, and there was a great deal of inflammation around the soft tissue. I thought that had some relation with the disorder in the eye. I removed them. There was excessive pain with the removal of each; they were very sore to

the touch. In probably five or six minutes after the teeth were removed, he said his eye felt better. He remained in my office one half hour and insisted that his eye was better. He called the next day to thank me for removing the teeth, and two weeks after that he could use one eye as well as the other.

Dr. JOHN ALLEN, of New York, read a paper on Artificial Dentistry, elucidating his well known method of "Continuous Gum Work," which called out considerable discussion of a practical nature.

By vote, a committee of three were appointed to take into consideration the recommendation of President Clark relative to the question of a reorganization or disbandment of the society. The committee were Drs. Fuller of Peekskill, N. Y., Lovejoy of Montreal, and White of Savannah, Ga.

Thursday Morning, August 16.

After relating various incidents of office practice, the report of the committee of three for dissolution is received, and is as follows:

We, as a committee, having been appointed to report upon the advisability of a change in the present organization of the A. D. Convention, having thoroughly investigated the matter, beg leave to report: That the purposes of its organization having apparently been subserved, would respectfully suggest that the same be permanently dissolved. We would also suggest that a committee of five be appointed to take into consideration the advisability of forming a new organization on a more permanent basis, said committee to be elected by the convention.

SAMUEL A. WHITE.
GEO. W. LOVEJOY.
E. D. FULLER.

Dr. AMBLER: It may be thought advisable and perhaps expected of me, from my long identification with this organization, and from the interest I have always taken in it since its organization, to say a few words. It has been to me THE organization suitable to the time and condition of the profession. It is entirely different from other organizations which are made up from representatives from local societies. These organizations are closed to the mass of the dental profession, but ours, from its democratic principles, admitting all to its membership, seemed to fill a gap. It was a necessity to those who could not reach organizations heretofore existing and now existing. This organization has done noble work, and I think we may point with pride to many a successful operator and young man who has received

perhaps not his first but his second impulses to investigation, and may have been stirred to exertions in his own behalf from the inspirations he has received from this meeting. Now the local societies have so multiplied in our land, and in all sections of the country, where district societies have been formed to such an extent that they reach all, so that there is hadly any practicing dentist in the country who may not enter one of them. For this reason I think the work of this organization has been completed, and I am ready to vote accordingly that the work is done and that it is well to dissolve the convention. We have now the American Dental Association, which is probably the first in the country. It stands highest, and there are very few dental practitioners but who can at some time, or some day, become a member. The only question presented to my mind is whether it is desirable to make any attempt at reorganization. It strikes me it is not, for the reason that I see no platform on which to stand. The only plan in which we differed from the others was the plan of universal admission. When I speak of universal admission, I mean admission which is surrounded with the safeguards of respectability. I always have been an advocate for the existence of the organization; for years and years I have worked to keep it alive, and you all know my efforts in that direction; they have been appreciated, and I am proud to say that I have been complimented from a number of sources because of my keeping the organization in existence, and it is with some regret that I see it pass out of existence. But when a member ceases to be of use to the body it is better that it be cut off, and therefore I am ready to vote in favor of the report, and shall be very happy to see it adopted.

By unanimous vote, the report is adopted and the convention is declared dissolved; all accounts are squared and the small balance in the treasury is contributed toward the publication of the proceedings.

Adjourned *sine die*.

BROOKLYN DENTAL SOCIETY.

The newly elected officers of the Brooklyn (N. Y.) Dental Society are as follows:

President—Dr. J. N. Race.
Vice-President—Dr. J. B. Brown.
Recording Secretary—Dr. L. G. Wilder.
Corresponding Secretary—Dr. Will. H. Johnston.
Treasurer—Dr. F. C. Walker.
Librarian—Dr. W. M. Ramsdell.

MARYLAND STATE DENTAL ASSOCIATION.

The Maryland State Dental Association was organized at the University of Maryland, October 18, with the following named officers for the ensuing year:

President—Dr. E. I. Smithers.

Vice-President—Dr. T. H. Davy.

Corresponding Secretary—Dr. Wm. A. Mills.

Recording Secretary—Dr. B. M. Hopkinson.

Treasurer—Dr. O. C. McCurdy.

Executive Committee—Drs. B. M. Wilkinson, J. C. Uhler, R. A. Hungerford.

WM. A. MILLS, *Cor. Sec.*

MASSACHUSETTS DENTAL SOCIETY.

The annual meeting of the Mass. Dental Society will be held in Boston on the 13th and 14th of December. An interesting meeting is expected.

EDITORIAL.

CLUBBING RATES.

Every dentist ought to take a *Medical* Journal. Among the *best* is the *New England Medical Monthly*, published by William C. Wile, M. D., Sandy Hook, Ct. Arrangements have been completed so that those of our subscribers who wish can have the NEW ENGLAND JOURNAL OF DENTISTRY and the *New England Medical Monthly*, for one year, by forwarding to us $3.00. The price per annum, for each journal, is $2.00. To secure the advantage of these clubbing rates, the $3.00 *must* accompany the order.

ELECTRIC GOLD FOIL.

A subscriber sends us the following:

The new Electric Gold Foil is a marvel of softness and cohesiveness. We believe that it is by far the finest working cohesive foil that has ever been offered to the profession. It is for sale by R. S. Williams.

"WHAT DIFFERENCE DOES IT MAKE TO ME WHETHER IT DIPS DOWN OR DIPS UP?"

A dentist who had attended the meeting of the New England Dental Society in Providence, and heard the papers of Prof. Garretson and Dr. Williams, together with the discussions thereon by Drs. Atkinson and Andrews, asked the question which heads this article, and added, that it made not the slightest difference to him which of the theories were true. "Either way, it would not help him to fill a tooth or assist him to properly construct a denture." His remarks furnish an excellent text for a short homily on the too prevalent tendency among dentists to treat with indifference or contempt any papers or discussions in societies or dental journals, wherein the connection between the essay and discussions, and their ability to earn increased fees, as a result of reading or listening, is not very apparent.

A search for truth, pure and simple, has no charm for some minds. Whether "bug" or "drug" be the chief factor in dental caries, many dentists care not. They deem it their sole business to remedy, for a fee, the effects of disease—not to study its etiology or to prevent it. Truths which are so obscure as only to be revealed by microscopic search, they deem of microscopic value. They seem forgetful of the fact that all the laws of matter which they do recognize, and in harmony with which they daily range themselves, and without the recognition and understanding of which they could not perform effectively the simplest operation, have been discovered by closely observing facts which, to the ordinary observer, were too obscure to attract attention. Failing to apply to these facts deductive reasoning, they see little use in histology and "fine spun theorizing" over phenomena which can only be discovered by the use of an immersion lens.

The "practical man," as some delight to call themselves, can see no use in studying the development and orderly growth of a tooth encased within bony walls because, he says, "I can't gain access to it to direct or control it if it is going wrong. I must even remain in ignorance as to whether it is going wrong or not until all is over, and the perfect or imperfect result is 'erupted;' whereas, I may go into my garden and direct the growth of my developing plants and vines. I can prune here, and support there. I can supply or withhold nourishment, as the case may seem to demand. By chemical analyses of plant and soil, I can even discover just what food is needed at different periods of the plant's growth. This I can supply, and my study, observation and research take tangible form and possess appreciable value at harvest time. Tell me how to fill a tooth more perfectly,

expeditiously, or economically, and I will be glad to listen to you. But," says the "practical man," "I take but 'little stock' in microscopy and histology."

Nothing is truer than the familiar aphorism, "Knowledge is power." And there is no knowledge but may be of use and confer power on its possessor.

The present status of anatomy and physiology, which is of such incalculable benefit to mankind, is the result of toilsome, patient and, to the "practical man," dull and tedious research. Gray and Carpenter, and others in the same field, have learned many things which possibly possess no very clearly defined commercial or practical value. But "who can tell whether shall prosper, this or that?"

> "Had we but a searching mind,
> Seeking truth where'er it springs,
> We should then true uses find
> Hidden in familiar things."

The dentist who takes no interest in investigating the order of development and the chemical make-up of the tissues upon which he daily operates, is very likely to be an intellectually lazy man, with all which that implies. He is likely to show a strong preference for acquiring what he does learn by the same methods the parrot learns his lessons. What he learns in this way is likely to have as little meaning for him as has the parrot's lesson for it. We all know that truths, or methods of our own discovering or unfolding, serve us the most faithfully and effectively, and remain to serve us long after the borrowed help has left our employ. No one can thoroughly familiarize himself with anything relating, even indirectly, to his chosen vocation without growing broader, more confident, and in every way better fitted for his hum-drum every day duties, or for an emergency. On the other hand, let a dentist neglect study, take no interest in searching out truths, simply because he conceives they have no commercial value, and he becomes narrow, soon finds himself moving in ruts, is unprogressive, and is pretty sure to "get left" in the race for a good class of patronage. The difference in the condition of the man who digs on our streets and the man who rides over them in comfortable equipage, is for the most part traceable to the difference in their intelligence. The first will labor, but is too indolent to think or, it may be, is incapable of sustained thought; the other has been a persistent student, it may be, in his lone room after a hard day's toil. Never mind. It has left its imprint on his brow, and marked every

lineament of his countenance. He possesses power because "Knowledge is power." If he is a physician, his services are sought for far and near; if a dentist, his practice is likely to be limited only by his ability to meet the demands upon his time.

Intellectual indolence is the barrier that obstructs the path to many a would-be dentist's success. The relation between histology, microscopy, etiology, chemistry, and kindred subjects connected with a dentist's calling, and his success, is the relation of fitness, adaptedness; and though the relation may be less direct and apparent than between some other studies and successful dentistry, yet rest assured that it is none the less real. No study can be intelligently pursued without breadth, mastery and fitness being the resultants. Let whosoever will, sow. Intelligence will be sure in the long run to reap the harvest.

DENTAL LEGISLATION IN CANADA.

We are indebted to Dr. W. Geo. Beers, of Montreal, for a copy of the *Montreal Daily Witness*, containing the following interesting history of dental legislation in the Provinces. Dr. Beers is made president of the Board of Examiners by recent election.

THE DENTISTS' MEETING.

Exactly fifteen years ago a number of dentists of Montreal, Quebec and Sherbrooke met at the office of Dr. Chas. Brewster, and organized the "Dental Association of the Province of Quebec;" and subsequently obtained an act of incorporation by unanimous desire of the profession. A Board of Examiners was elected, and the first start made toward systematizing the educational requirements of future practitioners. The act, unfortunately, was defective, and, notwithstanding several amendments, the Board was kept in litigation, and constant attempts were made to frustrate efforts to suppress the quackery which had grown up beside regular practice. In spite of this, the progress was very marked; a dental journal—the only one in Canada—was established, a voluntary Provincial Association, and the Montreal Dental Society, all of which were actively sustained. The defects in the Act continued to be a source of discouragement to the large majority of members, and of much trouble and expense to the few, and the success of opposition from unlicensed parties had no small share in disturbing the associative efforts. The Board, however, continued its work from year to year in a very unobtrusive way, and notwithstanding the difficulties peculiar to this Province, and which do not exist elsewhere, has done good service for the public and the profession. It may not be amiss here to say that the unremunerative character of the profession impelling almost every man in it

to seek outside sources of income, has increased year by year, and that while every other profession has its high compensations, dentistry remains the most taxing and unhealthy as well as the poorest paid of all. This grievance has become a serious one.

Last March the act of incorporation was again amended, and while valuable additions were secured, some unasked for clauses were inserted which have aroused much indignation in the profession. For instance, dentists who have had ten years' practice are entitled to exemption from the matriculation examination, should they desire to study and practice medicine. No such amendment was asked for or even thought of by the Association or the Board, and no such humiliation of the profession would be tolerated. The meeting on Wednesday, unanimously by resolution, repudiated the responsibility of the clause, and not only expressed strong disapproval of its unauthorized insertion in a thoughtless way, by a member in Quebec, but decided to petition the Legislature for its removal, as an unsolicited encroachment upon the Medical Bill.

Another specimen of individual tampering with the act, was found in the removal of two words in a clause, which was intended to prevent parties under civil interdict from practicing during the existence of the interdict. For instance, an unlicensed practitioner has been under a judicial interdict for several years, was previously rejected by the Board of Examiners upon examination on account of gross ignorance, which action was sustained by the Superior Court, and in appeal this subsequent application for a private bill was twice rejected by the Local Legislature, and upon several occasions he was prosecuted by patients for malpractcie, and paid damages in some cases. He afterwards issued a card with the following suggestive announcement: "No responsibility in extracting teeth or injuries accidentally inflicted in mouth." The interdict, which still exists, declares that he is "incapable of attending to business, not having the necessary intelligence," and that he is weak of mind, incapable to work alone, etc. It may surprise your readers to learn that this party was the means of again obstructing the wishes of the Association, and an unlicensed practitioner caused the removal of words which applied to persons nnder civil interdict, and obtained a special clause in the Dentists' Bill to give him legal right to practice in the face of his rejection by the Board of Examiners, by the Superior Court and Court of Appeals, and by the very Local Legislature which inconsistently gave him a privilege it twice before denied him. The special influence brought to bear in this case against the interest of the profession, and the public whom the Dental Board is constituted to protect, deserves publicity. The act was pushed through without the promised notice having been given to the secretary. It is a very humiliating reflection, that illegal practitioners by this clause, have had conferred upon them exceptional privileges denied to regular students and dentists. Doubtless, like many acts, its special applications were unknown to the majority of the members of the House.

PROF. GARRETSON ON PHILOSOPHY.

We quote the following from the *Philadelphia Press*, of Oct. 31st, which will explain itself. We are also glad to know that these lectures are drawing such crowds as to leave scarcely "breathing room" in the hall. We are not, however, surprised at this; should indeed be more surprised if it were otherwise. If space could be obliterated by a wish, we should be there, but this is one of the seemingly unfortunate limitations of *present* time.

The first of a series of philosophical lectures on the "Nature of Things" was delivered last night by Dr. J. E. Garretson, at the Hospital of Oral Surgery. The lecturer succeeded so thoroughly in presenting his views in such simple language; in making rich, happy similes; in impressing his ideas with such vigor that the usually dry subject of philosophy was invested with an interest seldom attendant upon such an address. Dr. Garretson was careful to say in the first few opening sentences that it was positively requisite that his hearers should follow him through the series in order to have a connected chain of ideas. He said:

"I may otherwise be denounced as a rank Atheist. Understand that we start at the point of simplicity—the prayer at the mother's knee. We travel around in a circle. Should you leave me when I have completed one quarter of the journey, you leave me a materialist; half way around, you become a Pantheist; three quarters, a Methodist. But continue with me, and we will return to the point from whence we started. I can give no better idea of what I intend to present than by quoting from one of the Platonic dialogues: One Hippocrates, a young man of family and of parts, desirous of becoming a citizen of note, went, accompanied by Socrates, to place himself under Protagoras as a teacher. 'What,' asked Socrates of Protagoras, 'do you propose to teach my beardless friend?' Turning to the youth, Protagoras replied: 'Young man, the advantage you will derive from associating with me is this: On the first day of your being with me you will return home a better man; on the second day, you will return home a still better man; and on each succeeding day you will become better.' I hope," said the lecturer, turning and pointing to the blackboard on which was written the words, "*In nomine domine*," "that when these lectures are concluded, you may, each and all of you, be able to live out the philosophy which I will try to teach."

A PRACTICAL ITEM.

We have not always found it easy to punch a hole in our rubber dam in just the right place. Particularly was this the case when we used to cut the hole with a knife, while the rubber was stretched over the end of an excavator. Not only did we not always succeed in getting the hole in the right place, but it was not, and could not be, by this uncertain method, always cut the right size. We have tried different punches, but consider Ainsworth's as near perfection as we are likely to obtain; and to assist us in *knowing* just where the holes should be cut, we have constructed a guide in this simple man-

ner: Take a piece of black walnut board (or of any other wood), three-fourths of an inch thick, outline on this a horse-shoe shaped piece, a little larger than a set of teeth, and cut it out. Lay on this a full denture of average size and shape, and mark where the center of each tooth comes. Now take some wire (Stubbs' No. 50 is good), size not essential, so it be stiff enough, cut into pieces about an inch long and point one end and square the other; drive these pins into the block where you have marked the center of the teeth. The ends of the pins should all be left on a level, which can readily be done by careful driving, and finally leveling up by rubbing over emery cloth or paper, laid on a smooth level surface. To use, lay the rubber to be punched on a table, or anywhere where it will lie smoothly. Dip the pins in water (letting them just touch the surface is sufficient), and a tiny drop will cling to the end of each pin. Set the pins on to your rubber, remove, and a moist dot appears for each tooth. Make your selection, and in cutting the hole, vary the position if you judge it necessary. This will be found an excellent guide many times, and it can be made almost in the time it has taken to write this item.

Prof. C. A. Brackett of Harvard, read a paper on "Mistakes and Failures" at a meeting of the New York Odontological Society, on the evening of Nov. 20. Before the paper was read, he exhibited a tooth (third inferior molar) which had in it a large corono-buccal cavity. About twenty-five years ago, the late Dr. Tucker, of Boston, told the patient, whose tooth it was, that it was either impossible or inexpedient to fill it. The late Dr. Bemis, being consulted, filled the buccal portion of the cavity with a composition of gutta-percha, and the coronal portion with gold—a gold band which had previously been fitted very accurately around the crown serving at once for a matrix and retainer of the gold plug.

About a year ago Dr. Brackett was consulted, and he filled a cavity that had formed at the neck with red gutta-percha, but the crown of the tooth subsequently broke off, and the root, which was loose, was removed. The specimen was very interesting, both as a sample of ingenious skill, and of the wonderful conservative qualities of gutta-percha when used for dental fillings.

By reading the papers of Drs. Garretson and Williams, to be found in this number, the interesting "points of difference" — to which we alluded in the November number in our item relative to the Providence meeting—may be clearly understood.

PUBLISHER'S NOTICE.

THE JOURNAL FOR 1884.

We would ask special attention to the *prospectus* of *Volume III.*, to be found elsewhere in this number. It embodies the aims and purposes of this journal for 1884. We feel confident that a large measure of these objects will be secured. Shall we have *your co-operation?* We propose no special pleadings for *renewals* or *new subscribers*. It is for each one to decide for himself whether he wants such a journal or no. The steady and unabating growth of our subscription list from the day our first number was issued until the present time, together with the surprisingly large number of encouraging letters and words of good cheer that have come unsolicited to us of late from very prominent men, lead us to believe that such a journal is appreciated by the profession. We shall continue our efforts to meet this manifest want, and with increased facilities and the efficient editorial aid of the gentlemen whose names are attached to the prospectus, we believe that every dentist will find it advantageous to see to it that his name appears on our subscription books. We send out a large number this month to non-subscribers. If such wish to see more of us and know us better, they will find a "blank" following the second page of the cover, which will be a convenient way for them to indicate such a wish.

We especially request that secretaries of societies will co-operate with us in giving to the profession whatever may be of general interest that occurs in their respective associations, thus helping to make the JOURNAL of essential value to every dentist. We shall be glad to correspond with the secretary of any society with reference to matters of mutual interest.

Arrangements are being made to secure monthly communications from foreign countries, and translations of all that is of special value in foreign dental publications. One of our associate editors, who has an extensive acquaintance with prominent men in these countries, will give special attention to this department.

Our circulation now extends all over the United States, into Canada, England, France, Germany, Italy and South America—a fact of importance to advertisers, to whom we shall be glad to offer space and rates.

THE JOURNAL CO.

DR. GREGG'S EXPERIMENTS.

One of our contributors has treated experiments of Dr. Gregg, of Buffalo, rather too carefully. The experiments have, as far as reported, a great number of stages where germs may be smuggled in. The fibrine mass is burned, but probably not completely; albumen is very resistant and contains within the charred cover for a long time only browned substance. Unless Dr. Gregg uses more than a Huxley's skill and care during the pulverizing process, "floating matter in the air" will fall in; and, as is well known, subsequent treatment with absolute alcohol only retards their development. As soon as the alcohol has evaporated they are again active, and in an imperfectly carbonized mass, nay, even in a carbonized mass, which contains all the salts of fibrine, they will grow on the ammonia of the air, etc. The experiments of Dr. Gregg seem hardly worth discussing, although a newspaper extract may not cover all. Is Dr. Gregg one of those men whom the laurels of others will deprive of sleep, or is he a careful student? We can hardly give an unbiased opinion without the full report of the experiments.

BOOKS AND PAMPHLETS.

DIFFICULT DENTITION, REFLEX ACTIONS AND THE USE OF THE GUM LANCET. By J. Morgan Howe, M. D., M. D. S., 34 West 35th street, New York. A reprint from the *Independent Practitioner* for November, 1883.

This is a thoroughly scientific and conservative paper on the above subject and worthy the study of every dentist and physician. In this paper the Doctor offers "some facts and suggestions as reasons for believing that the deductions of so many, reached by clinical experience, that dentition is a cause of nervous irritation and numerous reflex disturbances, is not a mistaken one." In taking this position, however, he recognizes the fact that this *extreme* view "has come to be so commonly accepted that it is quite probable that the origin of many" infantile ailments or "disturbances has often been falsely attributed to teething, as it furnished a sufficient scape-goat for indolence and ignorance." As between this view and that of some other writers, namely, that dentition is a normal physiological process, therefore it is absurd to claim it as being dangerous, or capable of producing fatal results, the author takes middle ground. While denying

that the disturbances common to infantile life are, to the extent very commonly accredited, due to "teething," it is nevertheless an important factor in producing them. He says: "The irritation so frequently produced by first dentition begins, as we have endeavored to show, at an early period, and may cause serious reflex disturbances at any time thereafter. The emesis, diarrhœa, and convulsions of this period, are of course liable to be produced by other causes, but the clinical experiences of numerous competent practitioners have been amply sufficient to confirm the old opinion, that these phenomena are often due to dental irritation, so that the conclusion will hardly be disturbed by argument based on the fact that dentition is a physiological process."

He refers briefly to diagnosis and, more at length, to treatment, which seem to us clear, concise and sensible, regarding as it does systemic treatment and the use of the lancet. Every one should read the paper.

N. W. AYER & SON'S AMERICAN NEWSPAPER ANNUAL, 1883. Philadelphia, Pa.

Contains a carefully prepared list of all Newspapers and Periodicals in the United States and Canada, arranged by States in Geographical Sections, and by Towns in alphabetical order.

In this list also is given the name of the paper, the issue, general characteristics, year of establishment, size, circulation, and advertising rates, &c.

Then follows a list of all Newspapers inserting Advertisements, arranged in States by Counties, with the distinctive features and circulation of each paper.

Also special lists of Religious, Agricultural and all known class publications. Trade Journals are arranged under their respective headings in alphabetical order, so that any paper published in the interest of any particular trade can be seen at a glance.

It gives the population of the United States, and of each State, Territory, County and County-seat, the chief Cities and Towns, and of nearly every place in which a paper is published, from the Census of 1880. Also similar information concerning the Dominion of Canada, from the Census of 1881.

It also gives the Political majorities and the Greenback vote of the States and Counties at the Presidential election of 1880.

It also contains a carefully prepared description of every County

in the United States, as well as of each State and Territory as a whole, and of each of the Canadian Provinces, giving valuable information concerning their mineral deposits, chief agricultural products, principal manufactures, nature of the surface and soil, location, area, etc.

On page 6 is given a Tabulated statement of Newspapers in each of the various sections of the country, giving the number of each issue in each State, Territory and Province; also the number of Counties and Towns in which papers are published, and the number of Towns which are County-seats; and on page 7 a summary of the above and a comparative statement of the increase of 1883 over 1882.

On pages 9 and 10 is a list of the Cities, Towns and Villages of the United States having a population of five thousand and upward, arranged in alphabetical order.

There is no other single publication within our knowledge which contains information of such varied use and value for general business purposes. Complete in all its departments, thorough in its details, giving just the information needed, and only that, simply arranged, easily referred to, carefully compiled—it is, in fact, a model work of its kind.

Price, $3.00.

THE PHYSICIAN'S VISITING LIST FOR 1884. By P. Blakiston, Son & Co., Philadelphia. Sold by druggists and booksellers generally.

The best of anything we have seen. It contains much of importance to dentists as well as physicians. Its "Dose Table, in *Metric* as well as *Apothecaries'* Weights and Measures," is worth its price.

ORAL SURGERY: A paper read by G. L. Parmele, M. D., D. M. D., before the Connecticut Medical Society.

A very interesting essay, full of those little, highly interesting stories for which Dr. Parmele is so well known. The N. E. JOURNAL has had the benefit of some of them. These cases illustrate much better than vague general rules certain special points.

COPP'S U. S. SALARY LIST AND CIVIL SERVICE RULES.

Our readers will welcome the solid information contained in the 160 pages of this recently-issued book. It is prepared by Henry N. Copp, a lawyer of Washington, D. C. All the Government salaries are given, from President Arthur's $50,000 to postmasters with $500, officials of the Treasury, Interior, War and Navy Departments, Custom Houses, post offices, and fully 20,000 federal offices arranged by States and Territories. Specimen examination questions for admittance to the Civil Service throughout the country are added. The price of the book is only 35 cents.

The people now have a chance to learn into whose pockets their money goes, and how the nation's income is expended.

CONNECTICUT VALLEY

Dental & Surgical Depot,

Nos. 445, 447, and 449 Main St.,

(OPPOSITE COURT SQUARE)

SPRINGFIELD, MASS.

[ESTABLISHED 1839.]

Dentists in the Connecticut Valley will find at this Depot a full and carefully selected stock of Material and Tools for Office and Laboratory work; Furniture, Apparatus &c.

Orders by mail, telephone or express have prompt attention, and every precaution taken to prevent injury in transportation.

STUDENTS wishing outfits, can buy from us anything required for Office or Laboratory use, and receive every advantage offered by the manufacturer.

THE BEST GOODS, AND AT MANUFACTURERS' PRICES.

Bigelow's Saponine Tooth Powder,

The favorite for over forty years, always in stock, and furnished in any quantity. Price, 50 cts. per pound.

TOOTH POWDERS, PASTES OR WASHES MADE TO ORDER FROM ANY FORMULA.

WM. M. WILLIAMS.

Codman & Shurtleff,

167 Tremont Street,

BOSTON,

HAVE IN STOCK A FULL ASSORTMENT OF

ARTIFICIAL TEETH,

EMBRACING THE MOST IMPROVED STYLES OF

H. D. JUSTI,

S. S. WHITE DENTAL MF'G CO.,

WILMINGTON DENTAL MF'G CO.,

GIDEON SIBLEY.

These will be sold at Manufacturers' Prices.

To persons who are not reached by our agents, we will send lots for selection.

The usual discounts allowed on $25.00, $50.00 and $100.00 lots.

As we have but ONE PRICE for all customers, Dentists sending for goods may be sure of just as favorable terms as though they came to the store themselves.

Careful attention will be given to selecting Teeth to fill orders.

---

167 TREMONT STREET. Dec. 1.

SOMETHING NEW,

AND WHAT EVERY DENTIST SHOULD HAVE.

BICKFORD'S

Dental Mouth Prop

No. 1. No. 2. No. 3.

This new device is intended to take the place of the Wooden Peg, or Cork, to keep the mouth of a patient open while administering Gas, for the Extraction of Teeth, or any operation that requires the teeth kept apart.

It consists of a prop made in the form of a telescope slide, pin and tube, with an inclosed spiral spring, and after being put into the patient's mouth, is held firmly in position against the teeth by the action of the spiral spring, and readily adapts itself to the opening and closing of the jaw. The prop is thus prevented from dropping out, and the mouth is kept open wide enough for any operation.

The outer ends of tube and pin are provided with socket pieces, in which are fitted blocks of rubber, to act as cushions to protect the teeth. They are made of metal, heavily nickel plated, so that while they possess greater strength than the wooden peg, they are much smaller and consequently take up less room. Further, they can be kept clean and bright and patients do not object to them. The cuts show the three regular sizes, Nos. 1, 2 and 3. No. 1, the longest, for FRONT teeth; No. 2, for BICUSPIDS; and No. 3 for MOLARS, or any portion of the mouth that requires a short prop. But any desired length will be made to order without extra charge. The Props are very easily taken apart and new springs put in when old ones get weak or worn out. Price, 10 cents each. New rubbers same price, per set of three.

Price, $1 each. - - Set of three, $2.50.

For sale at all Dental Depots, or by

WILLIS J. BICKFORD, D. D. S.,

North Attleboro, Mass.

HOOD & REYNOLDS, } Agents, BOSTON, MASS.
CODMAN & SHURTLEFF, }

For sale by WM. M. WILLIAMS, Springfield, Mass.

25 UNION STREET, Providence, R. I., Oct. 16, 1883.

DR J. W. BICKFORD—*Dear Sir:* I am using your Dental Mouth Props with great satisfaction. They are much the best things for the purpose I have ever seen.

Yours truly, F. N. SEABURY.

State Assayer and Chemist for Massachusetts.

Analysis and Scientific Research—Expert Testimony and Investigation.

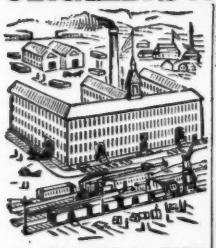
W. FRENCH SMITH, Ph. D.,

235 Washington Street, . . . P. O. Box 3126, . . . Boston.

(CORRESPONDENCE INVITED.)

BEATTY

ORGANS & PIANOS.



BEATTY'S ORGANS, Church, Chapel & Parlor, $30 to $1000, 2 to 32 stops. Have you seen "Beatty's Best" Parlor Organ? Price only $107.75 Chapel Organs $27.75 THE "LONDON," 18 stops 5 full sets of Reeds, ONLY $65. THE PARIS now offered FOR $85. Other desirable new styles now ready.

☞BEATTY'S FACTORY, RAILROAD AVE., & BEATTY ST. Washington, N. J., U. S. A. Over THREE ACRES OF SPACE. Largest Works in the World that ship products direct from Factory.

VISITORS ARE ALWAYS WELCOME!

SQUARE GRAND PIANO, New Style, No. 2,200 7⅓ Octaves, Elegant Rosewood Case, Rich Mouldings, double extra Wrest Plank, Carved Legs and Lyre, Grand French Action, Best Iron Frame, all improvements complete, with stool, book and cover, only, **$222.75.**

☞PIANOS, GRAND, SQUARE & UPRIGHT, $125 to $1,000. New 7 Octave Rosewood Square Pianos, $145; Elegant Rosewood Upright, $173.75. ☞OTHER OFFERS. Send for full particulars, list of Testimonials, etc. SEE BEATTY'S QUARTERLY.

☞ *Illustrated Catalogue. Free.*

Address, Daniel F. Beatty, Washington, New Jersey.

WRITE FOR CATALOGUE.

B. L. KNAPP & CO.

No. 161 Tremont Street,

BOSTON

NEW ENGLAND AGENTS FOR

Johnson & Lund's Improved Artificial TEETH.

HAVE CONSTANTLY ON HAND AN ASSORTMENT OF

AMALGAMS,

LATHES, VULCANIZERS,

AND

EXTRA TOUGH RUBBER.

B. L. Knapp & Co.'s Gold Foil, . . . $3.50 per ⅛ oz.
" " " " Pellets, . . . 3.50 per ⅛ oz.
Sizes, ½, ¾, 1, and 1½.

B. L. Knapp & Co.'s Untrimmed Gold Foil, . $3.25 per ⅛ oz., cash.

SMITH'S
Fifteen Minute Dental Rubber

HAS become widely known and a necessity to many Dentists. It makes a strong, durable plate, and is invaluable for repairing purposes.

Price, $3.25 per lb. 20 cents per sheet.

I have a large and well solected assortment of H. D. JUSTI'S and the W. D. M. Co's Artificial Teeth, also a full assortment of Bonwill Crowns, Golds, Amalgams, Rubbers, Forceps and Miscellaneous Dental Goods.

Orders filled with *care* and *promptness*.

Address **FRED. W. SMITH,**
DENTAL DEPOT,
P. O. Box 262, Binghamton, N. Y.

THE NEW YORK
Dental Manufacturing Company.

Factory, 161 West 29th Street, New York City.

OFFICE, FOR THE PRESENT,

On the First Floor of the Factory Building.

MR. GEO. E. HODGE

Has the charge and management of the business, and

MR. AUGUST WEBER

Will have the charge of the Factory, as heretofore.

PATENTS

MUNN & CO., of the SCIENTIFIC AMERICAN, continue to act as Solicitors for Patents, Caveats, Trade Marks, Copyrights, for the United States, Canada, England, France, Germany, etc. Hand Book about Patents sent free. Thirty-seven years' experience.

Patents obtained through MUNN & CO. are noticed in the SCIENTIFIC AMERICAN, the largest, best, and most widely circulated scientific paper. $3.20 a year. Weekly. Splendid engravings and interesting information. Specimen copy of the **Scientific American** sent free. Address MUNN & CO., SCIENTIFIC AMERICAN Office, 261 Broadway, New York.

ROBINSON'S

FIBROUS AND TEXTILE

METALLIC FILLING

FOR THE TEETH, AND FOR LINING

Robinson's Improved Patent Dental Plate.

A NEW MATERIAL.

For Sale by WM. M. WILLIAMS, Springfield, Mass.

In offering this material to the dentists and the public, I claim that it is, in the following particulars, superior to anything ever yet brought before the profession, and will supply a need long felt by every careful and experienced dentist:

1st. The material is so soft that it is more easily introduced into difficult places between the teeth than *any other metallic filling.*

2d. There is absolutely no recoil when placed in a cavity under hand pressure or the mallet.

3d. It is more certain of successful results in the hands of persons who cannot make first-class operations with gold.

4th. It does not soil or change color in the mouth.

5th. The welding properties are greater than any preparation except sponge gold.

6th. Gold welds to it as readily as gold welds to itself.

7th. It finishes easier than gold, and retains a fine and brilliant polish.

8th. It is superior for buccal, lingual and cervical walls, and in conjunction or inter locked with gold, will make a better filling than gold itself.

9th. It is a saving of more than half the expense and time.

10th. This material, though fibrous like Felt Foil, *is not* felt foil, as it contains no mercury.

11th. It is less of a conductor than gold, and there is less danger of trouble from thermal changes in large cavities with the walls lightly covering the nerves.

12th. In working this material, coarse and sharp serrated points should be used, as every one is aware that where the serrates are deep there is more surface of the metal to come in contact; and all pure metals will unite by heat and pressure when the surfaces are free from oxidation.

13th. This metal is excellent as a starting for gold fillings, as it saves making retaining points. It is better than tin foil, because it is more easily introduced into the cavity; it has more cohesive properties; it is harder on surface when it is consolidated, and retains its color better than tin foil.

This metal, as a lining for rubber and celluloid plates, entirely removes all inflammation, so common to the mucous surface of the mouth, brought on by wearing vegetable plates of any description. It is easily put on, and the fibers adhere so firmly, and weld so perfectly, that the lining cannot be removed any easier than paint from wood, and it will not wear off. It is cooling to the mouth, and will remove all inflammation as readily as platinum or gold, and it is the only article known that will make a rubber or celluloid plate fit to be worn in the mouth. It has never failed to restore the most diseased mouth to a healthy condition within four weeks after being worn.

Testimonials—Extracts.

Drs. JENNINGS & HARVEY, Cleveland, say: "We are satisfied your material welds into a solid mass suitable for all practical purposes for filling teeth." Dr. C. R. BUTLER, Cleveland, says: "The working qualities are most admirable." Dr. J. E. ROBINSON says: "Gold welds to it as readily as two pieces of gold weld together." Dr. HARROON, Toledo, says: "It is so soft and plastic that it can be brought into perfect contact with the walls of the cavity, thereby securing a most perfect filling." Drs. EVANS & EDSON, Toledo, say: "As a lining for rubber and celluloid plates, it is firmly attached, and cannot fail to remove that soreness and uneasiness experienced by persons wearing artificial dentures." ACME S. PEASE, Jackson, Mich., says: "I have worn rubber for six years that kept my mouth so inflamed that I was obliged to discontinue its use. I have worn gold, and find that, with the single exception of thickness, it is equal to gold plate." Dr. METCALF, Kalamazoo, says: "It gives me pleasure to indorse it as the best substitute for gold in the market." Miss EMMA SHIPLEY writes me: "My mouth was covered with granulated elevations that discharged bloody mucus from wearing rubber, and was entirely healed from wearing Robinson's Patent Lined Plate in four weeks." Dr. H. C. SITES, Fort Wayne, Ind., writes: "You do not claim enough for your material. As a lining for plates, it makes them next to gold, and gold welds to it in filling as readily as gold welds to itself." Dr. WM. CAHOON, Detroit, writes: 'I never found real comfort in twenty-five years until I struck your improved metal-lined plate." Dr. RUSH MCCREGGOR, Albion, N. Y., writes: "I am so impressed with its value as a marked improvement upon every thing of the kind I have ever used, that I cannot afford to be without it. Gold takes to it as kindly as it does to itself." WILSON & SMITH, Rochester, N. Y., write: "Every day convinces us of the great value of your material for filling teeth."

LAWRENCE'S AMALGAM.

This Amalgam has received the indorsement of the Profession at large for nearly forty years, which would seem to render any remarks as to its excellence superfluous. Retail price, Three Dollars per ounce.

Purchase only of reliable dealers, their agents, or of the inventor and *only* manufacturer,

AMBROSE LAWRENCE, M. D., 476 Columbus Avenue, Boston, Mass.

HARDMAN'S
Superior Amalgam.

TRY IT, if you wish to Use the Best.

MADE AND FOR SALE AT $3.50 PER OZ., BY J. HARDMAN, MUSCATINE, IOWA.

Large discount on orders of quantity.

For Sale by WM. M. WILLIAMS, Springfield, Mass.

1860. ***1883.***

UNION TOOTH COMPANY,

Office and Factory,

Oxford, New York.

MANUFACTURERS OF ALL KINDS OF

Gum and Plain Teeth.

EXTRA LARGE PINS.

All our teeth are fitted with Large Headed Pins, (not pinched heads), and are so inserted in the porcelain as to give an extra amount of strength.

We specially invite comparison with those of other manufacturers, the ***weight, thickness*** and ***size*** of blocks being taken into account.

Send $1 and your address for sample. Liberal discount for quantities.

N. B. See that the above Trade Mark is stamped on the Wax when you buy.

CAULK'S FILLING MATERIALS.

PRICE,
Two Colors
GRAY
AND
YELLOW,
$2.00
Per Package

CAULK'S
TRADE
DIAMOND
MARK.
CEMENT.
Price, $2.00

PRICE,
One Color,
GRAY,
YELLOW,
MEDIUM
LIGHT,
$1.00
Per Package

THIS COMPOUND NOW STANDS WITHOUT A RIVAL.

From two to four years' test by Leading Dentists throughout the world has proved it to be all that has been claimed for it.

Fillings that have been standing in the mouth **over** three years, in comparison with other plastic material in the market, show not only its SUPERIORITY, but it has proved to be *more insoluble* than many of the so-called insoluble cements.

We have increased the quantity fully one-third, and all bottles are lettered with "*Caulk's Diamond Cement.*"

CAULK'S PAR-EXCELLENCE ALLOY (Gold and Platina).

With one exception, we were the first to manufacture an Amalgam containing Gold and Platina, although we did not call it such, simply our trade name, Par-Excellence Alloy, which fully expresses the superiority of this combination of metals over others. It has always contained the requisite quantity of these precious metals in conjunction with Silver and Tin, mixed upon scientific principles in their proper chemical relations to each other, to make it what it has long since proven to be,—the best Alloy for filling teeth in the market. The large and increasing sales during the past few years have conclusively demonstrated this fact.

PRICE, $3.00 PER OZ. Put up in 1 oz., ½ oz. and ¼ oz. packages.

CAULK'S WHITE ALLOY (For Incisor Teeth).

This Alloy is made expressly for front teeth, is of a peculiar grayish-white color, which will retain its brightness under all circumstances. Price same as Par-Excellence Alloy. Two ounces, one of each, for $5.00.

CAULK'S HYDRAULIC PEBBLES.

This Cement differs from others, it being in the form of pebbles or granules. It is a chemical combination of some of the constituents of the Natural Tooth, and when properly manipulated has the bony-like characteristics of such materials. It is harder, tougher, and stronger, resists the fluids of the mouth to a greater degree, and after *one year's trial* is more of an *insoluble compound* than most cements have proved to be.

Its *hydraulic* qualities render it invaluable for setting pivot teeth. It is so pliable that it can be moulded or shaped into various forms, and when crystallization is complete, can be carved and polished, same as the sculptor does his marble.

Price, Large Package, $3.00. Small do, $1.50

Caulk's Diamond Point Stopping.

The Stopping is put up in *sealed envelopes*, and the Pellets and Cylinders in *sealed boxes*, each bearing a fac-simile of our signature.

PRICE, in ¼, ½ and ½ ounce packages, per ounce, $4.00

L. D. CAULK,

Sold at all Dental Depots. Manufacturer & Proprietor, CAMDEN, DELAWARE.

If your Dealer or Agent does not have these materials, send your order to our address and it will receive prompt attention.

BEWARE OF FRAUDS AND IMITATORS.

THE REESE

DENTAL BASE

This Base is superior as a scientifically compounded alloy of gold, silver and tin in such proportion as to secure the most admirable results in practice.

A *duplicate* of the wax model, for whatever purpose used, is secured when a casting is made of Reese Metal, thus insuring a fit at once in making plates for artificial teeth with this Base.

The casting is so smooth as to make very little finishing necessary when the model has been properly made in wax. The finished case appears like platina.

The conductive agreement with the tissues of the mouth is superior to that of any Base now known, and thus there is no decomposition of the saliva and no heating and irritating of mucous surfaces so common where non-conducting materials are employed as a base. The process in making dental plates is very similar to that employed in rubber work, and all branches of artificial dentistry may be successfully performed with the Reese Metal, not excluding continuous gum.

A denture may be constructed with this Base in less time than with *any* other conducting material, and the process of manufacture is the most cleanly known. This Base has proved eminently satisfactory to patients, especially those with mouths diseased by the wearing of non-conducting or illy-fitting plates. For the mounting of artificial crowns upon roots, this metal has been used with extremely gratifying results, and when the waste of the tooth substance has been very extensive,

it is believed a successful operation may be performed with this metal not possible with any other process. The method of mounting crowns, which is employed by the undersigned, is of such simplicity as to commend itself to any operator, and makes the use of *any* form of tooth or crown admissible. For *accurate* casting of any kind, this metal has no superior, and, it is believed, no equal.

THE PROFESSION

is invited to make a practical trial of this Base at an expense of five dollars. The undersigned will forward, upon receipt of this fee, and a *plaster* impression of any *full upper* case for which a denture is desired, a plate prepared with a simple pocket, into which may be moulded rubber, celluloid or any plastic material used for artificial dentures, with which the necessary teeth, either gum or plain, are to be attached. The selection and adjustment are thus under the control of the operator, who in this way has the advantage of a conducting plate of perfect fit, without spending the time in learning a new method, and without requiring an investment in new apparatus until satisfied with the trial the above affords.

Charges for carriage must be prepaid *both* ways in all cases.

We invite correspondence, and will furnish particulars, circulars and pamphlets upon application.

GEORGE F. REESE. WM. H. ATKINSON.

REESE & ATKINSON,

41 East 9th Street,

NEW YORK CITY.

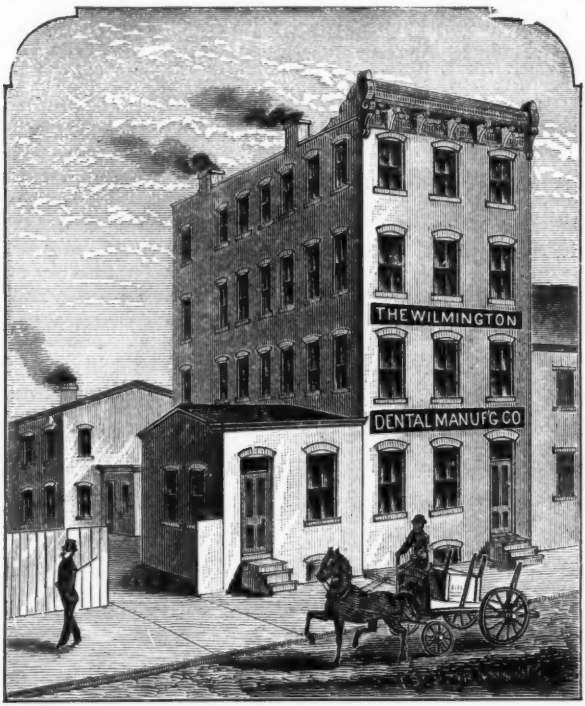
THE

Wilmington Dental Manufacturing Co.

MANUFACTURERS OF

Superior Artificial Teeth,

Manufacturers of and Dealers in Dental Supplies,



Office and Factory, - - - Nos. 1010 and 1012 King Street,

WILMINGTON, DELAWARE,

Take this opportunity to announce to the Dental Trade and Profession, that having removed to their new Factory, they are now more fully prepared than ever to fill all orders with which they may be favored. By means of their new furnaces they have succeeded in so conserving the heat as to present a life-like appearance, and to secure great durability in their teeth; their new moulds of latest design furnish the dental profession with a variety from which to select. They believe that they have a tooth equal to the best, and they solicit an examination and test as to their FORM, COLOR, TEXTURE, STRENGTH and DEEPLY IMBEDDED DOUBLE-HEADED PINS.

Price lists and all information promptly given. Ask your nearest dealer for them.

THE WILMINGTON DENTAL MANUFACTURING CO.,

WILMINGTON, DELAWARE.

Branch Depot, 340 Fulton Street, Brooklyn, N. Y.

HOOD & REYNOLDS,

DENTAL DEPOT,

74 TREMONT STREET, - - BOSTON, MASS.

MANUFACTURERS OF

Gold Foil, and Dealers in all Kinds of Dental Goods.

The Round Cylinders are mostly used for old style wedge filling.

We sell ten times as many Flattened Cylinders as we do of all the rest.

GOLD CYLINDERS.

STYLE A,

Flattened.

Nos. ½ 1 1½ 2

STYLE A,

Loose, and can be used as Pellets.

Nos. ½ 1 1½ 2 3

STYLE B,

Loose, but more compact than Style A.

Nos. 1 2 3 4

STYLE C,

Compact, but not Hard; used as Cylinders only.

Nos. 2 3 4 5 6

These numbers are to denote that No. ½ is a half sheet of No. 4 Gold Foil, cut into strips and rolled into cylinders; No. 1, one sheet; No. 1½, one sheet and a half; No. 2, two sheets, etc. Two Patents Sept. 19, 1876. Patent Sept. 25, 1876. Patent April 17, 1877.

These cylinders are made from Soft Foil, otherwise called Accommodation Foil, and can be made cohesive by annealing. The advantage over sheet foil is, that they are ready for use, and therefore save the time consumed in preparing foil; also, loss in scraps. As they are made from Soft Foil, and cut by machinery into strips, and then rolled into cylinders, without any handling with the hands, they are in the most favorable condition for use.

In making these cylinders our best 1,000 Gold Foil is used.

PRICE LIST.

CYLINDERS AND FOIL.

Per ⅛ ounce, ...	$4.00
Per ¼ ounce, ...	15.00
Per 1 ounce, ...	30.00
Per 2 ounce lots, per ounce, ...	29.00

GIDEON SIBLEY,

MANUFACTURER OF

ARTIFICIAL TEETH

AND DEALER IN

DENTAL SUPPLIES,

THIRTEENTH and FILBERT STS.,

PHILADELPHIA, PA.

It is gratifying to find, that after years of assiduous labor, to produce the best Teeth made, that their superiority is so universally acknowledged, and that the rapid demand for them has necessitated large additions to our FACTORY and SALESROOM.

Points on which we Seek Comparison:

STRENGTH, NATURAL SHAPES, TEXTURE, COLORS, LARGE DOUBLE HEADED PINS, &c., COMBINED WITH OUR VERY LARGE ASSORTMENT OF MOULDS AND VARIETY OF SHADES.

☞ Ask your Dealer for them, or send One Dollar for a Sample Set.☜

DON'T USE

SIBLEY'S

Gold and Platinum Alloy,

If after using it according to directions, it does not prove SUPERIOR to any other ALLOY or AMALGAM in the market.

DON'T USE

SIBLEY'S

Gold and Platinum Alloy,

If it will not stand all tests essential to a FIRST-CLASS FILLING

DON'T USE

SIBLEY'S

Gold and Platinum Alloy,

If it DISCOLORS in the mouth.

DON'T USE

SIBLEY'S

Gold and Platinum Alloy,

If it SHRINKS or EXPANDS.

USE

SIBLEY'S

Gold and Platinum Alloy,

If it PROVES to be the BEST, but not otherwise.

Price $3.00 per oz. Put up in 1 oz., 2-3 and 1-3 oz. packages.

MANUFACTURED BY

GIDEON SIBLEY,

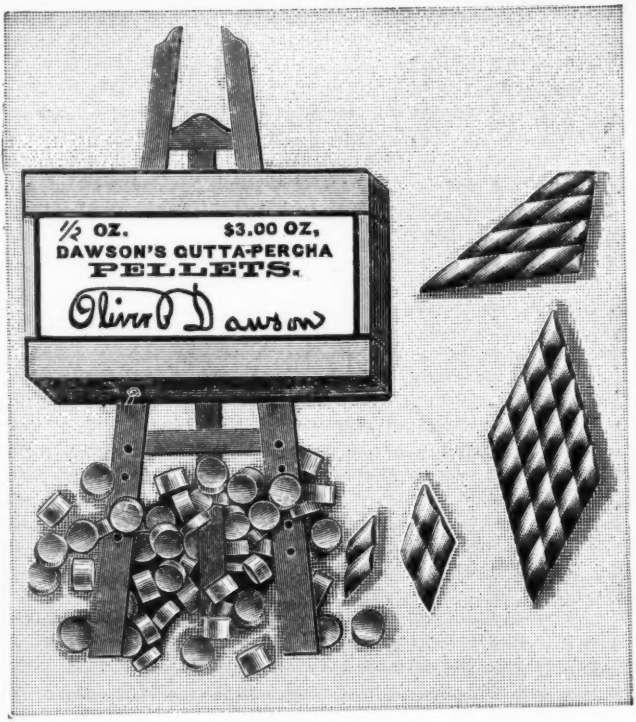
13th and Filbert Streets, DENTAL DEPOT,

PHILADELPHIA, PA.

SEND $1.00 FOR 1-3 OZ. SAMPLE PACKAGE.

Dawson's Improved Gutta-Percha Filling.

PELLETS, POINTS, CYLINDERS and WAFERS, $3.00 Per Oz.



GUTTA-PERCHA STOPPING OF THIS QUALITY HAS NEVER BEFORE BEEN OFFERED TO THE DENTAL PROFESSION.

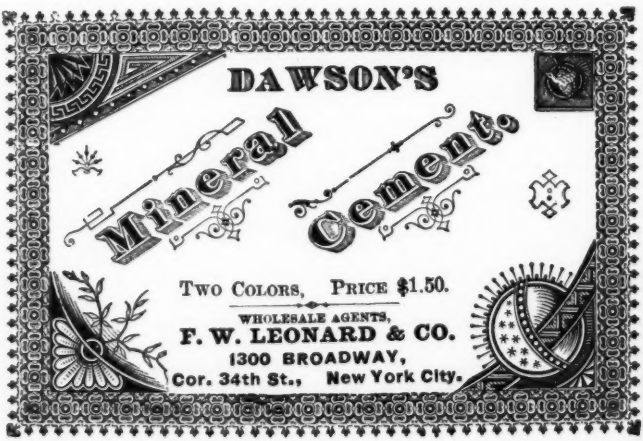
We quote below a few remarks from our last letter from Prof. J. Foster Flag:

Dr. O. B. Dawson: *Dear Sir,*—The sample of Gutta-Percha Stopping you last sent me is the toughest that I have ever worked, and seems to possess so much merit that I would like to know more of it. . . . Is the result due to an exceptionally good Gutta-Percha? . . . . If you can make such Stopping as you sent, I should be pleased to aid you in bringing it before the professon in a very decided manner, etc., etc.

Truly yours, J. FOSTER FLAGG.

DAWSON'S MINERAL CEMENT.

It has no equal for attaching Crowns and Filling Carious Teeth in cases where a Plastic Filling is indicated.



A trial will convince you of its Extreme Hardness and Resistance to Corrosive Agents.

It is known and used by hundreds of operators in the Eastern and Middle States, to whom we respectfully refer.

F. W. LEONARD & CO.,
1300 Broadway, DENTAL DEPOT, New York.

DAWSON'S WHITE ALLOY:

Cohesive, Malleable and White.

The most honest objection heretofore made to amalgam is that it turns black and is liable to stain, disfigure and even destroy tooth structure. *This need not be*; for there are metals which, combined and amalgamated with *chemically pure mercury*, do not oxidize or tarnish, even under the most adverse circumstances. And, if previous to use, it has been ascertained that the salts (oxides) of the metals are not soluble in the menstrum circulating in the tooth, they will not, CANNOT affect the tooth structure.

Heat expands metallic substances. When an alloy has been amalgamated in the palm of the hand, the operator will observe that the heat is evolved. Now, if this is allowed to depart (said Dr. Whildon Foster, of Baltimore, in criticism of an essay by us), if this heat is allowed to depart previous to its introduction into the cavity, it will not then contract; for crystallization at low temperature is not a process of contraction. A familiar example is the freezing of water and the consequent bulging and bursting of the containing vessel or pipe.

The following named gentlemen endorse it, and we use their names by permission:

Dr. JOHN B. RICH, . . .	New York.	Dr. E. PARMLEY BROWN, .	Flushing, L. I.
Dr. W. D. TENISON, . .	" "	Dr. J. BOND LITTIG, . .	New York.
Dr. C. S. STOCKTON, . .	Newark, N. J.	Dr. WM. F. DAVENPORT, . .	" "

And many other prominent dentists.

When amalgamating this Alloy the best results are obtained when the minimum amount of Mercury is used, 2 gr. of Mercury to 6 gr. of Alloy.

When used in these proportions, it has a remarkably fine grain, packs very close, takes and retains a beautiful white finish, which is a property unknown in other amalgams. **It contains the five essential elements for Good Color and Edge Strength.**

Oliver B. Dawson

NEW YORK, July 16, 1883.

Dr. OLIVER B. DAWSON: *Dear Sir*,—I have received a large number of letters of inquiry in relation to your White Alloy. These letters remain unanswered for the reason that I have not had the time to reply to them. But it would give me great pleasure to express in some way the satisfaction I have experienced in the use of the Amalgam made with it. In the proportions in which I use it—one part of Mercury to two parts of the Alloy, it produces the best plastic filling I have ever constructed. Becoming very hard and tough, it is susceptible of receiving a high polish, and does not shrink under severe tests. In color, it is a very light gray, which does not change in the mouth. Possessing, as it certainly does, the above valuable qualities, I consider it the best Alloy I have ever used. Very respectfully,

JNO. B. RICH.

F. W. LEONARD & CO.,

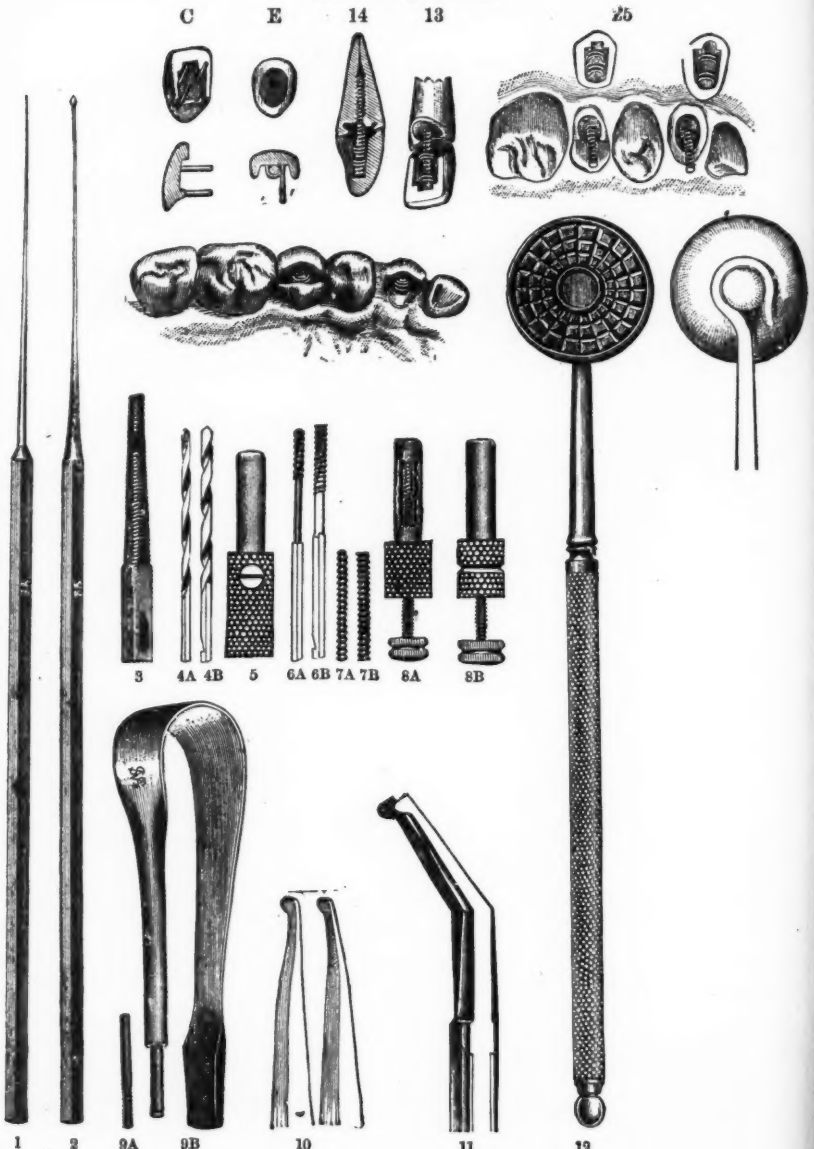
Dental Depot, 1300 Broadway, N. Y., Corner 34th Street.

DR. HOW'S PATENT TOOTH CROWNS

AND APPLIANCES FOR MOUNTING THEM.

FOUR-PIN CROWNS.

(Patented April 10, 1883.)



For description of Nos. 1 to 10, see DENTAL COSMOS, April, 1883.

No. 11 is a pair of Crown Pliers, curved, for binding the pins over a post in a lower root.

No. 12 is a carrier with which amalgam, gutta-percha, cement, or other filling-material may be held close to the cavity, permitting the easy use of the packing instruments. The cup is of soft rubber, the handle being attached as shown in the side cut. The surplus material is readily removed from the cup by pressing the sides together at the conclusion of the operation, as in clearing the rubber plaster bowl. (*Continued on next page.*)

The Four-Pin or "How" Crowns are now in stock, centrals, laterals, and cuspids; for bicuspids, the cuspids are in all cases to be used, contouring the backing to form the inner cusp.

A COMPLETE SET of the How Appliances consists of one No. 1, one No. 2, two No. 3, two No. 4 (A and B), two No. 5, two No. 6 (A and B), four No. 7 (two A's and two B's), two No. 8 (A and B), one No. 9 (A and B), one No. 10, one No. 11, and one No. 12.

A LIMITED SET, for testing the method, consists of one each of Nos. 1, 2, 3, 4B, 5, 6B, 7B, 8B, 9, 10, and a suitable selected Four-Pin Crown. With this limited set, the method may be practiced in a large class of cases; but many roots will require the smaller sizes (A) of Posts and Appliances, which can be ordered by number as occasion demands.

A TRIAL SET consists of Nos. 4, 5, 6, 7, 9, and a Four-Pin Crown. When the trial set only is purchased, the post must be screwed into the root with a pair of common pliers, though these will mar the threads in turning and bending the post. They will also serve to bend the pins over the mandrel. This *trial* suggestion is made to meet the wishes of some who desire to try first the fewest parts that may be made to answer for accomplishing an experimental working of the method.

If the operator has not a pair of excising forceps, he should add them to his order, as of great use in preparing the root, and in cutting off the post after it is fixed in the root and found too long for proper occlusion, or for fitting the crown. We make for this purpose a curved excising forceps, similar to our No. 31, but with narrow beaks. Price, in Plain Line, $2.50; or in Best Quality, $3.

PRICES.

Complete Set,	$12.25
Limited "	6.50
Trial "	2.55

PARTS SEPARATELY.

No. 1.	Spring-tempered Canal Plugger,	each	$ .23
No. 2.	Gates Drill,	"	.25
No. 3.	Flexible Gauge, for Plugger or Gates Drill,	"	.50
No. 4.	Twist Drill; two sizes, A and B,	"	.15
No. 5.	Drill Chuck, for Twist Drill or Screw Tap,	"	.50
No. 6.	Screw Tap; two sizes, A and B,	"	.50
No. 7.	Screw Post; two sizes, A and B,	"	.25
No. 8.	Screw Post Chuck; two sizes, A and B,	"	1.50
No. 9.	Crown Mandrel, with two sizes of shanks, A and B,	"	1.00
No. 10.	Crown Pliers, straight,	"	1.50
No. 11.	Crown Pliers, curved,	"	1.75
No. 12.	Holder for Filling Materials,	"	.40
The Rubber Cup of same, if separate,		"	.15
The Four-Pin Tooth-Crowns,		"	.15

The S. S. WHITE Dental Mf'g Co.

Philadelphia, New York, Boston, Chicago, Brooklyn.

WATT'S IMPROVED METAL.

BETTER THAN ANY IN USE!

Six Ingots to the Pound. **Per Ingot, $1.00,**

Printed Instructions with each Ingot.

This metal is far superior to the well known Watt & Williams metal. It is the result of diligent research, aided by abundant leisure, and long experience in the science of metallurgy.

Watt's Metal is stronger and runs sharper than any in use, while it withstands chemical action within the mouth better than 18 carat gold.

It has no equal for lower plates, gives a much better fit than rubber, celluloid, or gold, and is a good conductor o heat and electricity. Weight is often advantageous; but if shrinkage is very great, a base plate of the metal may be made, and the teeth attached to it with rubber or celluloid. Most beautiful upper or lower dentures may be thus made, and no other work has greater durability.

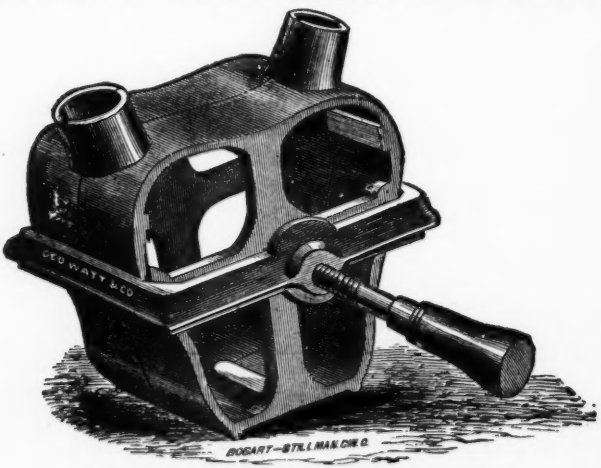
Molds may be made in almost any flask, but a glance at the cut of the Watt Flask will persuade any one to buy it who intends to use the work.

Ask your Dental Depot for it, or send to

RANSOM & RANDOLPH, Wholesale Agents,

83 Jefferson Street, **TOLEDO, OHIO.**

WATT'S MOLDING FLASK



PRICE, COMPLETE $1.00.

Manufactured and for Sale by RANSOM & RANDOLPH,

TRADE SUPPLIED. **TOLEDO, OHIO.**

For Sale by HOOD & REYNOLDS, 74 Tremont St., Boston.

For Sale by W. M. WILLIAMS, Springfield, Mass.

Porcelain Teeth.

Beginning at Vienna, in 1873, where I made my first display, I have received successively at the Six World's Fairs the highest Award for ***ARTIFICIAL TEETH;*** *this being the most important branch of my business and all that I exhibited.*

The greatest proof ever extended for Superiority to any manufacturer of ***PORCELAIN TEETH,*** *for their Strength, Adaptation and Natural Life-like Appearance, was received by me through the Report of the Judges; Centennial International Exhibition 1876.*

EXTRACT

FROM THE GENERAL REPORT OF THE JUDGES ON AWARDS OF GROUP XXIV.

"H. D. Justi EXHIBITED NOTHING BUT TEETH, but his display was beautiful in the extreme. In color, translucency and texture, they were all that could be desired; they were a faithful reproduction of the physiological characteristics of the natural organs, both to the individual teeth and relatively to the entire set. Their conformation with reference to close and easy adaptation to the maxillary arch showed careful study of the needs of both patient and operator. Their various and numerous deviations from uniformity of arch and outline, simulating the irregularities of nature, was so perfect that when in the mouth no suspicion of their artificial nature would be entertained. The disposition of tooth-material was so skillfully managed as to secure the greatest amount of strength with the least bulk; and the insertion of platinum pins was so arranged as to render their displacement an almost impossible accident."

H. D. JUSTI,

BRANCH:
66 E. Madison Street, Chicago.

PRINCIPAL DEPOT:
No. 516 ARCH STREET, Philadelphia.

REDUCTION IN PRICE.

ONE POUND

Extra Tough Rubber.

TRADE MARK.

JOHNSON & LUND,

SOLE PROPRIETORS.

620 Race St. PHILAD'A.

514 Wabash Av. CHICAGO.

Registered in Patent Office at Washington, Nov. 21, 1874.

THE EXTRA TOUGH RUBBER is offered to the Profession with the assurance that its good qualities place it ahead of all the Rubber Bases. It is made of the best Para Gum, which is carefully purified. Owing to the great preponderance of Gum in its composition, it is very light in proportion to bulk. Its marked characteristics are STRENGTH and ELASTICITY, and even at the additional cost is cheaper than the Red Rubber, as a much thinner plate is required.

THE EXTRA TOUGH RUBBER is susceptible of a very high polish. A sample will be sent free on application, as it is our desire to give *ocular proof of its qualities.*

It vulcanizes in fifty-five minutes at 320 deg. Fahrenheit. Each pound contains from twenty to twenty-two sheets.

Per pound, $3.00. 5-pound lots, $2.70 per pound. 10-pound lots, $2.40 per pound.

S. Weaver, Shipman & Co., Printers.